**3GPP TSG CN Plenary Meeting #16** **NP-020219**
**5th - 7th June 2002. Marco Island, USA.**

**Source:** **TSG CN WG 1**

**Title:** **CRs to R99 (with mirror CRs) on Work Item GSM/UMTS interworking towards 24.008**

**Agenda item:** **7.6**

**Document for:** **APPROVAL**

---

**Introduction:**

This document contains **9** CRs on **R99 including mirror CRs to** Work Item **" GSM/UMTS interworking"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #16 for approval.

| Spec | CR | Rev | Phase | Subject | Cat | Version-Current | Version-New | Meeting-2nd-Level | Doc-2nd-Level |
|---|---|---|---|---|---|---|---|---|---|
| 24.008 | 579 | 1 | R99 | Correction to CS domain specific system information | F | 3.11.0 | 3.12.0 | N1-23 | N1-020881 |
| 24.008 | 580 | 1 | Rel-4 | Correction to CS domain specific system information | A | 4.6.0 | 4.7.0 | N1-23 | N1-020882 |
| 24.008 | 581 | 1 | Rel-5 | Correction to CS domain specific system information | A | 5.3.0 | 5.4.0 | N1-23 | N1-020883 |
| 24.008 | 592 | 2 | Rel-5 | Impact of regional roaming restrictions on the MM state | A | 5.3.0 | 5.4.0 | N1-24 | N1-021388 |
| 24.008 | 599 | 1 | R99 | R97 and R99 Compatibility | F | 3.11.0 | 3.12.0 | N1-23 | N1-020889 |
| 24.008 | 611 | | Rel-4 | R97 and R99 Compatibility | A | 4.6.0 | 4.7.0 | N1-23 | N1-020890 |
| 24.008 | 612 | | Rel-5 | R97 and R99 Compatibility | A | 5.3.0 | 5.4.0 | N1-23 | N1-020891 |
| 24.008 | 627 | 1 | R99 | Impact of regional roaming restrictions on the MM state | F | 3.11.0 | 3.12.0 | N1-24 | N1-021386 |
| 24.008 | 628 | 1 | Rel-4 | Impact of regional roaming restrictions on the MM state | A | 4.6.0 | 4.7.0 | N1-24 | N1-021387 |

**3GPP TSG-CN1 Meeting #23**
**Fort Lauderdale, Florida, USA 08. - 12. April 2002**

***Tdoc N1-020881***
Revision of N1-020706

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **579** ⌘ **rev** **1** ⌘ Current version: **3.11.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Correction to CS domain specific system information |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | GSM – UMTS interworking |
| ***Date:*** | ⌘ | 8.4.2002 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

*Use one 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 one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*REL-4 (Release 4)*
*REL-5 (Release 5)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Incorrect octet numers in Table 10.5.1.12.2 |
| ***Summary of change:*** | ⌘ | Correction in Table 10.5.1.12.2 |
| ***Consequences if not approved:*** | ⌘ | The specification remains incorrect |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 10.5.1.12.2 |
| ***Other specs affected:*** | ⌘ | [ ] Other core specifications ⌘<br>[ ] Test specifications<br>[ ] O&M Specifications |
| ***Other comments:*** | ⌘ | |

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

### 10.5.1.12.2 CS domain specific system information

The purpose of the *CN domain specific GSM-MAP NAS system information* element, when used for the CS domain, is to provide the MS with actual parameter settings of parameters relevant only for MM functionality. The coding of the information element identifier and length information is defined in the 3GPP TS 25.331. Only the coding of the content is in the scope of the present document.

For CS domain, the content of the *CN domain specific GSM-MAP NAS system information* element is coded as shown in figure 10.5.1.12.2/3GPP TS 24.008 and table 10.5.1.12.2/3GPP TS 24.008. The length of this element content is two octets. The MS shall ignore any additional octets received.

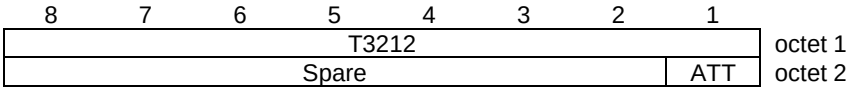


**Figure 10.5.1.12.2/3GPP TS 24.008 *CS domain specific system information* element**

**Table 10.5.1.12.2/3GPP TS 24.008: *CS domain specific system information* element**

| |
|---|
| **T3212 timeout value** (1 octet field)<br>The T3212 timeout field is coded as the binary representation of the timeout value for periodic updating in decihours. Bit 8 in octet 1~~3~~ is the most significant bit and bit 1 in octet 1~~3~~ is the least significant bit.<br>Range: 1 to 255<br>The value 0 is used for infinite timeout value i.e. periodic updating shall not be used<br><br>**ATT, Attach-detach allowed** (1 bit field):<br>Bit 1<br>0 MSs shall not apply IMSI attach and detach procedure.<br>1 MSs shall apply IMSI attach and detach procedure<br><br>The bits 2 – 8 of octet 2~~1~~ are spare and shall be coded all zeros. |

**3GPP TSG-CN1 Meeting #23**
**Fort Lauderdale, Florida, USA 08. - 12. April 2002**

***Tdoc N1-020882***
Revision of N1-020707

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **580** ⌘ **rev** **1** ⌘ Current version: **4.6.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Correction to CS domain specific system information |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | GSM – UMTS interworking |
| ***Date:*** | ⌘ | 18.3.2002 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | Rel-4 |

*Use one 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 one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *REL-4* | *(Release 4)* |
| *REL-5* | *(Release 5)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Incorrect octet numers in Table 10.5.1.12.2 |
| ***Summary of change:*** | ⌘ | Correction in Table 10.5.1.12.2 |
| ***Consequences if not approved:*** | ⌘ | The specification remains incorrect |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 10.5.1.12.2 |
| ***Other specs affected:*** | ⌘ | [ ] Other core specifications ⌘<br>[ ] Test specifications<br>[ ] O&M Specifications |
| ***Other comments:*** | ⌘ | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

### 10.5.1.12.2 CS domain specific system information

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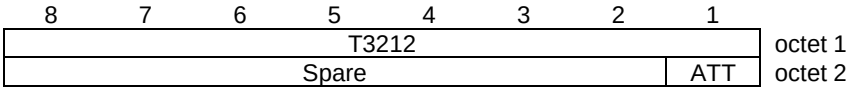


**Figure 10.5.1.12.2/3GPP TS 24.008 *CS domain specific system information* element**

**Table 10.5.1.12.2/3GPP TS 24.008: *CS domain specific system information* element**

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**3GPP TSG-CN1 Meeting #23**
**Fort Lauderdale, Florida, USA 08. - 12. April 2002**

***Tdoc N1-020883***
Revision of N1-020708

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **581** ⌘ **rev** **1** ⌘ Current version: **5.3.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Correction to CS domain specific system information |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | GSM – UMTS interworking |
| ***Date:*** | ⌘ | 18.3.2002 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | Rel-5 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
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| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
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| *REL-5* | *(Release 5)* |

| | | |
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| ***Other comments:*** | ⌘ | |

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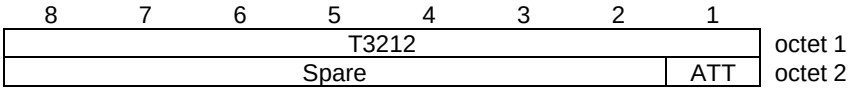


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**3GPP TSG-CN1 Meeting #24**
**Budapest, Hungary, 13. – 17. May 2002**

***Tdoc N1-021388***
Revision of N1-021275

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **592** ⌘ **rev** **2** ⌘ Current version: **5.3.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Impact of regional roaming restrictions on the MM state |
| ***Source:*** | ⌘ | Siemens AG |
| ***Work item code:*** | ⌘ | GSM/UMTS interworking |
| ***Date:*** | ⌘ | 02.05.02 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | REL-5 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
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*2* *(GSM Phase 2)*
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*R97* *(Release 1997)*
*R98* *(Release 1998)*
*R99* *(Release 1999)*
*REL-4* *(Release 4)*
*REL-5* *(Release 5)*

***Reason for change:*** ⌘

1) In R99 and Rel-4, regional roaming restrictions can be realized in shared network scenarios by means of the "equivalent PLMN list" and the (G)MM reject causes #11, #12, #13 and #15. These features, however, only allow to influence the cell and PLMN selection in idle mode. RAN3 and SA2 only recently started to study for Rel-5 the enhancements necessary to enforce regional roaming restrictions also in the connected mode. Enhancements to GERAN will not be possible before Rel-6.

Therefore, in a R99/Rel-4/Rel-5 network it may happen that an MS in MS operation mode A or B, with an ongoing CS call, is handed over to a cell in which it is rejected by the SGSN, when it tries to perform a GPRS attach, routing area update or service request procedure. (Note that an MS in MS operation mode B in GSM will change to operation mode A in UMTS, see TS 24.008, subclause 4.7.1.7 c.)

In the current version of TS 24.008 it is stated that in case of a GPRS attach, a network initiated GPRS detach, a normal or periodic routing area update, or a service request procedure, if the MS receives reject cause #11, #12, #13 or #15, it shall (among other things) perform the following actions:

- If the MS is IMSI attached via MM procedures, the MS shall set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. **The new MM state is MM IDLE.**
- Furthermore, the MS shall perform a PLMN selection (causes #11 and #13) or a cell selection (cause #12), or it shall search for a suitable cell in another location area in the same PLMN (cause #15).

That means that an MS in MS operation mode A has to drop the ongoing circuit switched call. Furthermore, an MS that is only IMSI attached for non-GPRS services will drop the ongoing circuit switched call when the subscriber tries to change to MS operation mode A and attach for GPRS services.

2) In case of receipt of a Service Reject with reject cause #15 the new GMM state should be GMM-REGISTERED.LIMITED-SERVICE instead of GMM-

| | |
|---|---|
| | REGISTERED.ATTEMPTING-TO-UPDATE. |
| ***Summary of change:*** ⌘ | 1) In case of a GPRS attach, a network initiated GPRS detach, a normal or periodic routing area update, or a service request procedure:<br>if the MS is in MS operation mode A and an RR connection exists, the MS shall after receipt of one of the reject causes #11, #12, #13 and #15 postpone the actions specified for the MM entity until the RR connection is released.<br><br>2) The new GMM state after receipt of a Service Reject with reject cause #15 is changed to GMM-REGISTERED.LIMITED-SERVICE.<br><br>3) A clarification is added that the new GMM state after receipt of a network initiated Detach REQUEST message with reject cause #11 is GMM-REGISTERED.<br><br>4) After receipt of GMM reject cause #3, #6 or #8, the MS shall abort an existing RR connection, unless an emergency call is ongoing. |
| ***Consequences if not approved:*** ⌘ | The MS will loose ongoing circuit-switched calls, if it is operating in MS operation mode A or B and handed over to a cell in which the MS is operating in MS operation mode A and for which regional roaming restrictions apply.<br><br>This scenario is supposed to happen frequently e.g. in the following case: Operators X and Y have separate 3G networks. There is a roaming agreement allowing subcribers of operator Y to roam in the 2G network of operator X, but not in his 3G network.<br>If a subscriber of operator Y, while roaming in the 2G network, requests for a service which is only provided by the 3G network (e.g. a CS multimedia call), the network is expected to initiate a service handover to the 3G network of operator X. (Note that the serving BSC does not have the necessary information to determine that the subscriber should be handed over to the 3G network of operator Y.) |

| | | | |
|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.7.3.1.4, 4.7.4.2.2, 4.7.5.1.4, 4.7.13.4 | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ |
| ***Other comments:*** | ⌘ | If the MS behaves as proposed in this CR and a further handover to another location area or PLMN happens during the lifetime of the RR connection, the MS will<br>- in GMM state GMM-DEREGISTERED.LIMITED-SERVICE (after Attach Reject) perform a new GPRS attach;<br>- in GMM state GMM-REGISTERED.LIMITED-SERVICE (after RAU Reject or Service Reject) perform another RAU<br>if the location area and the PLMN ID is not on one of the forbidden lists. That means that PS services can be used again as soon as possible. | |

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# First modified section

### 4.7.3.1.4 GPRS attach not accepted by the network

If the attach request cannot be accepted by the network, an ATTACH REJECT message is transferred to the MS. The MS receiving the ATTACH REJECT message, stops timer T3310 and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take one of the following actions depending upon the reject cause:

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

If the MS is IMSI attached ~~via MM procedures~~, the MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall abort the RR connection, unless an emergency call is ongoing. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

# 8 (GPRS services and non-GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. ~~The new MM state is MM IDLE.~~

The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall abort the RR connection, unless an emergency call is ongoing. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

# 11 (PLMN not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2), shall reset the GPRS attach attempt counter and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE or optionally to GMM-DEREGISTERED.PLMN-SEARCH.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

A GPRS MS operating in MS operation mode A or B in network operation mode II or III, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED(and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is specified in subclause 4.7.3.1.5.

# Next modified section

### 4.7.4.2.2 Network initiated GPRS detach procedure completion by the MS

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach required", the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED. The MS shall, after the completion of the GPRS detach procedure, initiate a GPRS attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

A GPRS MS operating in MS operation mode A or B in network operation mode I, which receives an DETACH REQUEST message with detach type indicating "re-attach required" or "re-attach not required" and no cause code, is only detached for GPRS services in the network.

When receiving the DETACH REQUEST message and the detach type IE indicates "IMSI detach", the MS shall not deactivate the PDP contexts. The MS shall set the MM update status to U2 NOT UPDATED. A MS in operation mode A or B in network operation mode I may send a DETACH ACCEPT message to the network, and shall re-attach to non-GPRS service by performing the combined routing area updating procedure according to subclause 4.7.5.2, sending a ROUTING AREA UPDATE REQUEST message with Update type IE indicating "combined RA/LA updating with IMSI attach". A MS in operation mode C, or in MS operation mode A or B in network operation mode II or III, shall send a DETACH ACCEPT message to the network.

If the detach type IE indicates "IMSI detach", or "re-attach required" then the MS shall ignore the cause code if received.

If the detach type information element value indicates "re-attach required" or "re-attach not required" and the MS is attached for GPRS and non-GPRS services and the network operates in network operation mode I, then if in the MS the timer T3212 is not already running, the timer T3212 shall be set to its initial value and restarted.

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach not required" and the cause code is not "#2 (IMSI unknown in HLR)", the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED.

If the detach type IE indicates "re-attach not required", then, depending on the received cause code, the MS shall act as follows:

# 2 (IMSI unknown in HLR);

The MS shall set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE. The SIM shall be considered as invalid for non-GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for GPRS services in the network.

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall abort the RR connection, unless an emergency call is ongoing. ~~The new MM state is MM idle.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network.

# 8 (GPRS services and non-GPRS services not allowed);

~~The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and the update status to U3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2). Furthermore, it shall delete any P-TMSI, P-TMSI signature, TMSI, RAI, LAI, ciphering key sequence number and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.~~

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED.

The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall abort the RR connection, unless an emergency call is ongoing. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

# 11 (PLMN not allowed);

The MS shall delete any RAI or LAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2). The new GMM state is GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- A GPRS MS operating in MS operation mode A or B shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED(and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE or optionally to GMM-DEREGISTERED.PLMN-SEARCH.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list.

A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED(and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

Other cause values shall not impact the update status. Further actions of the MS are implementation dependent.

# Next modified section

### 4.7.5.1.4 Normal and periodic routing area updating procedure not accepted by the network

If the routing area updating cannot be accepted, the network sends a ROUTING AREA UPDATE REJECT message to the MS. An MS that receives a ROUTING AREA UPDATE REJECT message, stops timer T3330, and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take different actions depending on the received reject cause value:

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

If the MS is IMSI attached ~~via MM procedures~~, the MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall abort the RR connection, unless an emergency call is ongoing. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

If the update type is "periodic updating" a GPRS MS operating in MS operation mode A or B in networkoperation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

# 9 (MS identity cannot be derived by the network);

The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to subclause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

# 10 (Implicitly detached);

The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

# 11 (PLMN not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the routing area updating attempt counter and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

If the update type is "periodic updating" a GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B in network operation mode II or III, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in subclause 4.7.5.1.5.

# Next modified section

## 4.7.13.4 Service request procedure not accepted by the network

~~—~~If the Service request cannot be accepted, the network returns a SERVICE REJECT message to the mobile station. An MS that receives a SERVICE REJECT message stops timer T3317. The MS shall then take different actions depending on the received reject cause value:

# 3 (Illegal MS); or

# 6 (Illegal ME);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall abort the RR connection, unless an emergency call is ongoing. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

# 9 (MS identity cannot be derived by the network);

- The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to subclause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

# 10 (Implicitly detached);

- The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

# 11 (PLMN not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED.

- The MS shall store the PLMN identity in the "forbidden PLMN list".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - A GPRS MS operating in MS operation mode A shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

  - The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

- The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

  - The MS shall perform a cell selection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) ~~attempt counter~~ and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

- The MS shall store the LAI in the list of "forbidden location areas for roaming".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 15 (No Suitable Cells In Location Area);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-REGISTERED.LIMITED-SERVICE~~ATTEMPTING TO UPDATE~~.

- The MS shall store the LAI in the list of "forbidden location areas for roaming".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

  - The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

# 40 (No PDP context activated)

- The MS shall deactivate locally all active PDP contexts and the MS shall enter the state GMM-REGISTERED.NORMAL-SERVICE. The MS may also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in subclause 4.7.13.5.

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*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **599** ⌘ **rev** **1** ⌘ Current version: **3.11.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | R97 and R99 compatibility |
| ***Source:*** | ⌘ | Nortel Networks |
| ***Work item code:*** | ⌘ | GSM-UMTS interworking |
| ***Date:*** | ⌘ | 09.4.2002 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

*Use one 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 one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*REL-4 (Release 4)*
*REL-5 (Release 5)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | In R99, the QoS IE increased in length. There are no requirements for an entity to support a shorter length QoS IE.<br>Also, semantical and syntactical error definitions are already specified in 24.007 and therefore should not be included in 24.008. |
| ***Summary of change:*** | ⌘ | - Replacement of the text on syntactical and semantical errors in 8.1 with a reference to 24.007.<br>- Entities supporting this version of the protocol shall support reception of a QoS IE of length 5 or 13 octets. |
| ***Consequences if not approved:*** | ⌘ | Interoperability problem between some R97 mobiles in R99 networks. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ 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.

# 8 Handling of unknown, unforeseen, and erroneous protocol data

## 8.1 General

The procedures specified in 3GPP TS 24.008 and call-related supplementary service handling in 3GPP TS 24.010 apply to those messages which pass the checks described in this clause.

This clause also specifies procedures for the handling of unknown, unforeseen, and erroneous protocol data by the receiving entity. These procedures are called "error handling procedures", but in addition to providing recovery mechanisms for error situations they define a compatibility mechanism for future extensions of the protocols.

Error handling concerning the value part of the Facility IE and of the SS Version Indicator IE are not in the scope of the present document. It is defined in 3GPP TS 24.010 and the GSM 04.8x series.

Clauses 8.1 to 8.8 shall be applied in order of precedence.

Most error handling procedures are mandatory for the mobile station.

Detailed error handling procedures in the network are implementation dependent and may vary from PLMN to PLMN. However, when extensions of this protocol are developed, networks will be assumed to have the error handling that is indicated in this clause as mandatory ("shall") and that is indicated as strongly recommended ("should"). Clauses 8.2, 8.3, 8.4, 8.5 and 8.7.2 do not apply to the error handling in the network applied to the receipt of initial layer 3 message: If the network diagnoses an error described in one of these clauses in the initial layer 3 message received from the mobile station, it shall either:

- try to recognize the classmark and then take further implementation dependent actions; or
- release the RR-connection.

Also, the error handling of the network is only considered as mandatory or strongly recommended when certain thresholds for errors are not reached during a dedicated connection.

For definition of semantical and syntactical errors see 3GPP TS 24.007 [20], subclause 11.4.2.

~~In this clause the following terminology is used:~~

~~An IE is defined to be syntactically incorrect in a message if it contains at least one value defined as "reserved" in clause 10, or if its value part violates rules of clause 10. However it is not a syntactical error that a type 4 IE specifies in its length indicator a greater length than defined in clause 10.~~

~~A message is defined to have semantically incorrect contents if it contains information which, possibly dependent on the state of the receiver, is in contradiction to the resources of the receiver and/or to the procedural part (i.e. clauses 3, 4, 5) of 3GPP TS 24.008, 3GPP TS 24.010, or relevant GSM 04.8X series.~~

### 10.5.6.5 Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 13 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-13.

A QoS IE received without octets 6-13 shall be accepted by a receiving entity.

NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

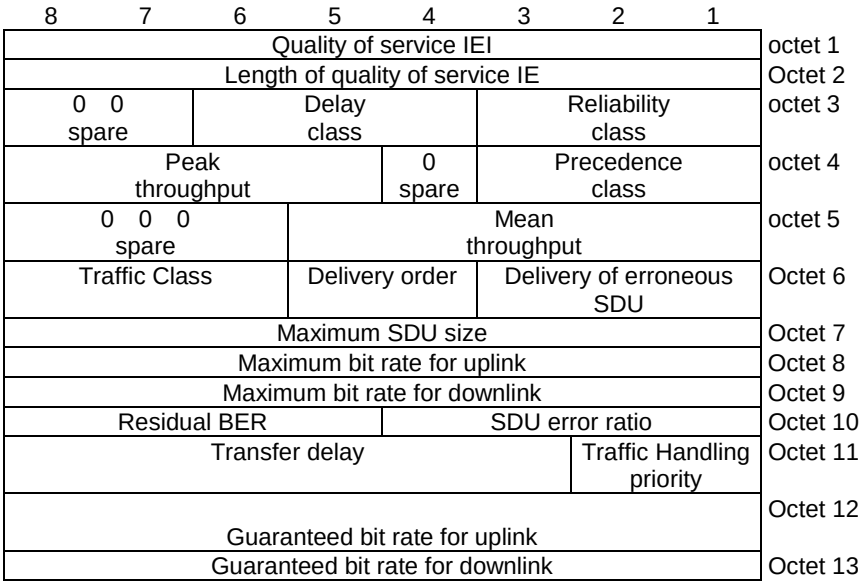


**Figure 10.5.138/3GPP TS 24.008: *Quality of service* information element**

**3GPP TSG-CN1 Meeting #23** ***Tdoc N1-020890***
**Fort Lauderdale, Florida, USA 08. - 12. April 2002**

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **611** ⌘ **rev** **-** ⌘ Current version: **4.6.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | R97 and R99 compatibility |
| ***Source:*** | ⌘ | Nortel Networks |
| ***Work item code:*** | ⌘ | GSM-UMTS interworking |
| ***Date:*** | ⌘ | 09.04.2002 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | Rel-4 |

*Use one 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 one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*REL-4 (Release 4)*
*REL-5 (Release 5)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | In R99, the QoS IE increased in length. There are no requirements for an entity to support a shorter length QoS IE.<br>Also, semantical and syntactical error definitions are already specified in 24.007 and therefore should not be included in 24.008. |
| ***Summary of change:*** | ⌘ | - Replacement of the text on syntactical and semantical errors in 8.1 with a reference to 24.007.<br>- Entities supporting this version of the protocol shall support reception of a QoS IE of length 5 or 13 octets. |
| ***Consequences if not approved:*** | ⌘ | Interoperability problem between some R97 mobiles in R99 networks. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

# 8 Handling of unknown, unforeseen, and erroneous protocol data

## 8.1 General

The procedures specified in 3GPP TS 24.008 and call-related supplementary service handling in 3GPP TS 24.010 [21] apply to those messages which pass the checks described in this subclause.

This subclause also specifies procedures for the handling of unknown, unforeseen, and erroneous protocol data by the receiving entity. These procedures are called "error handling procedures", but in addition to providing recovery mechanisms for error situations they define a compatibility mechanism for future extensions of the protocols.

Error handling concerning the value part of the Facility IE and of the SS Version Indicator IE are not in the scope of the present document. It is defined in 3GPP TS 24.010 [21] and the 3GPP TS 04.8x series.

Sub subclauses 8.1 to 8.8 shall be applied in order of precedence.

Most error handling procedures are mandatory for the mobile station.

Detailed error handling procedures in the network are implementation dependent and may vary from PLMN to PLMN. However, when extensions of this protocol are developed, networks will be assumed to have the error handling that is indicated in this subclause as mandatory ("shall") and that is indicated as strongly recommended ("should"). Subclauses 8.2, 8.3, 8.4, 8.5 and 8.7.2 do not apply to the error handling in the network applied to the receipt of initial layer 3 message: If the network diagnoses an error described in one of these subclause s in the initial layer 3 message received from the mobile station, it shall either:

- try to recognize the classmark and then take further implementation dependent actions; or
- release the RR-connection.

Also, the error handling of the network is only considered as mandatory or strongly recommended when certain thresholds for errors are not reached during a dedicated connection.

For definition of semantical and syntactical errors see 3GPP TS 24.007 [20], subclause 11.4.2.

~~In this subclause the following terminology is used:~~

~~- An IE is defined to be syntactically incorrect in a message if it contains at least one value defined as "reserved" in clause 10, or if its value part violates rules of clause 10. However it is not a syntactical error that a type 4 IE specifies in its length indicator a greater length than defined in clause 10.~~

~~- A message is defined to have semantically incorrect contents if it contains information which, possibly dependent on the state of the receiver, is in contradiction to the resources of the receiver and/or to the procedural part (i.e. clauses 3, 4, 5) of 3GPP TS 24.008, 3GPP TS 24.010 [21], or relevant 3GPP TS 04.8X series.~~

### 10.5.6.5 Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 13 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-13.

A QoS IE received without octets 6-13 shall be accepted by a receiving entity.

NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

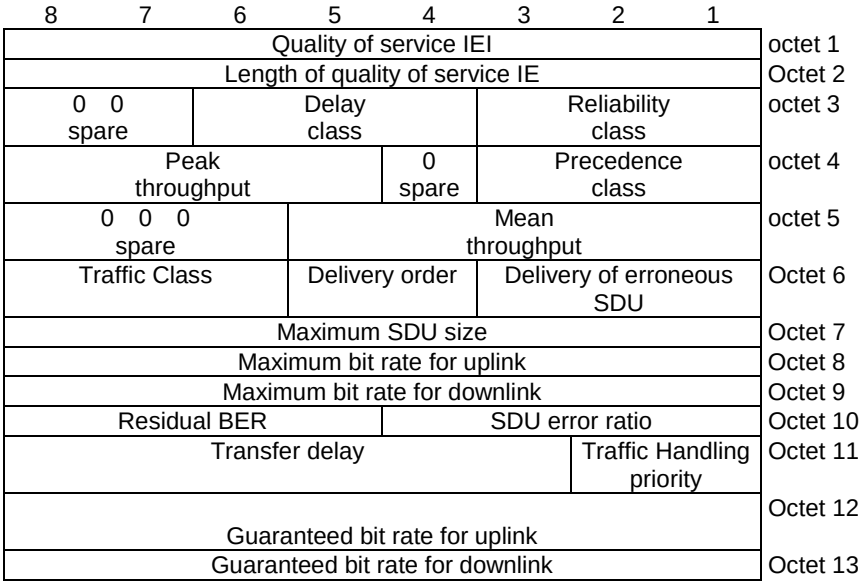


**Figure 10.5.138/3GPP TS 24.008: *Quality of service* information element**

**3GPP TSG-CN1 Meeting #23** ***Tdoc N1-020891***
**Fort Lauderdale, Florida, USA 08. - 12. April 2002**

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **612** ⌘ **rev** **-** ⌘ Current version: **5.3.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | R97 and R99 compatibility |
| ***Source:*** | ⌘ | Nortel Networks |
| ***Work item code:*** | ⌘ | GSM-UMTS interworking |
| ***Date:*** | ⌘ | 09.04.2002 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | Rel-5 |

*Use one 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 one of the following releases:*
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*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*REL-4 (Release 4)*
*REL-5 (Release 5)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | In R99, the QoS IE increased in length. There are no requirements for an entity to support a shorter length QoS IE.<br>Also, semantical and syntactical error definitions are already specified in 24.007 and therefore should not be included in 24.008. |
| ***Summary of change:*** | ⌘ | - Replacement of the text on syntactical and semantical errors in 8.1 with a reference to 24.007.<br>- Entities supporting this version of the protocol shall support reception of a QoS IE of length 5, 13 or 14 octets. |
| ***Consequences if not approved:*** | ⌘ | Interoperability problem between some R97 mobiles in R99 networks. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

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# 8 Handling of unknown, unforeseen, and erroneous protocol data

## 8.1 General

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This subclause also specifies procedures for the handling of unknown, unforeseen, and erroneous protocol data by the receiving entity. These procedures are called "error handling procedures", but in addition to providing recovery mechanisms for error situations they define a compatibility mechanism for future extensions of the protocols.

Error handling concerning the value part of the Facility IE and of the SS Version Indicator IE are not in the scope of the present document. It is defined in 3GPP TS 24.010 [21] and the 3GPP TS 04.8x series.

Sub subclauses 8.1 to 8.8 shall be applied in order of precedence.

Most error handling procedures are mandatory for the mobile station.

Detailed error handling procedures in the network are implementation dependent and may vary from PLMN to PLMN. However, when extensions of this protocol are developed, networks will be assumed to have the error handling that is indicated in this subclause as mandatory ("shall") and that is indicated as strongly recommended ("should"). Subclauses 8.2, 8.3, 8.4, 8.5 and 8.7.2 do not apply to the error handling in the network applied to the receipt of initial layer 3 message: If the network diagnoses an error described in one of these subclause s in the initial layer 3 message received from the mobile station, it shall either:

- try to recognize the classmark and then take further implementation dependent actions; or
- release the RR-connection.

Also, the error handling of the network is only considered as mandatory or strongly recommended when certain thresholds for errors are not reached during a dedicated connection.

For definition of semantical and syntactical errors see 3GPP TS 24.007 [20], subclause 11.4.2.

~~In this subclause the following terminology is used:~~

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### 10.5.6.5 Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

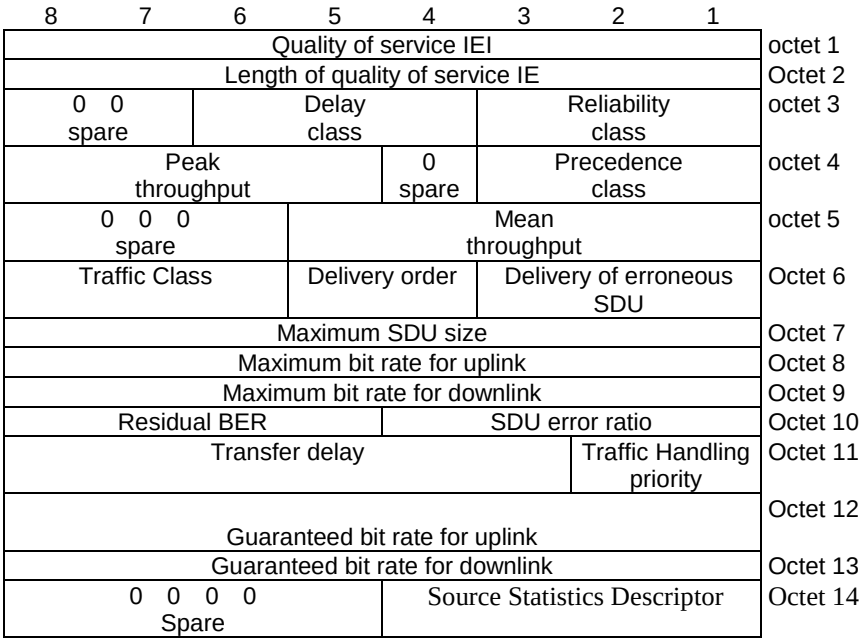
The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 14 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-14~~3~~.

A QoS IE received without octets 6-14 or without octet 14 shall be accepted by a receiving entity.

NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.



**3GPP TSG-CN1 Meeting #24**
**Budapest, Hungary, 13. – 17. May 2002**

***Tdoc N1-021386***
Revision of N1-021273

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **627** ⌘ **rev** **1** ⌘ Current version: **3.11.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Impact of regional roaming restrictions on the MM state |
| ***Source:*** | ⌘ | Siemens AG |
| ***Work item code:*** | ⌘ | GSM/UMTS interworking |
| ***Date:*** | ⌘ | 14.05.02 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

*Use one 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 one of the following releases:*
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*R97* *(Release 1997)*
*R98* *(Release 1998)*
*R99* *(Release 1999)*
*REL-4* *(Release 4)*
*REL-5* *(Release 5)*

***Reason for change:*** ⌘

1) In R99 and Rel-4, regional roaming restrictions can be realized in shared network scenarios by means of the "equivalent PLMN list" and the (G)MM reject causes #11, #12, #13 and #15. These features, however, only allow to influence the cell and PLMN selection in idle mode. RAN3 and SA2 only recently started to study for Rel-5 the enhancements necessary to enforce regional roaming restrictions also in the connected mode. Enhancements to GERAN will not be possible before Rel-6.

Therefore, in a R99/Rel-4/Rel-5 network it may happen that an MS in MS operation mode A or B, with an ongoing CS call, is handed over to a cell in which it is rejected by the SGSN, when it tries to perform a GPRS attach, routing area update or service request procedure. (Note that an MS in MS operation mode B in GSM will change to operation mode A in UMTS, see TS 24.008, subclause 4.7.1.7 c.)

In the current version of TS 24.008 it is stated that in case of a GPRS attach, a network initiated GPRS detach, a normal or periodic routing area update, or a service request procedure, if the MS receives reject cause #11, #12, #13 or #15, it shall (among other things) perform the following actions:

- If the MS is IMSI attached via MM procedures, the MS shall set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. **The new MM state is MM IDLE.**
- Furthermore, the MS shall perform a PLMN selection (causes #11 and #13) or a cell selection (cause #12), or it shall search for a suitable cell in another location area in the same PLMN (cause #15).

That means that an MS in MS operation mode A has to drop the ongoing circuit switched call. Furthermore, an MS that is only IMSI attached for non-GPRS services will drop the ongoing circuit switched call when the subscriber tries to change to MS operation mode A and attach for GPRS services.

2) In case of receipt of a Service Reject with reject cause #15 the new GMM state should be GMM-REGISTERED.LIMITED-SERVICE instead of GMM-

| | |
|---|---|
| | REGISTERED.ATTEMPTING-TO-UPDATE. |
| ***Summary of change:*** ⌘ | 1) In case of a GPRS attach, a network initiated GPRS detach, a normal or periodic routing area update, or a service request procedure:<br>if the MS is in MS operation mode A and an RR connection exists, the MS shall after receipt of one of the reject causes #11, #12, #13 and #15 postpone the actions specified for the MM entity until the RR connection is released.<br><br>2) The new GMM state after receipt of a Service Reject with reject cause #15 is changed to GMM-REGISTERED.LIMITED-SERVICE.<br><br>3) A clarification is added that the new GMM state after receipt of a network initiated Detach REQUEST message with reject cause #11 is GMM-REGISTERED.<br><br>4) The statement "The new MM state is MM IDLE." is deleted for GMM reject causes #3, #6 and #8 to allow the MS to continue an ongoing emergency call. |
| ***Consequences if not approved:*** ⌘ | The MS will loose ongoing circuit-switched calls, if it is operating in MS operation mode A or B and handed over to a cell in which the MS is operating in MS operation mode A and for which regional roaming restrictions apply.<br><br>This scenario is supposed to happen frequently e.g. in the following case: Operators X and Y have separate 3G networks. There is a roaming agreement allowing subcribers of operator Y to roam in the 2G network of operator X, but not in his 3G network.<br>If a subscriber of operator Y, while roaming in the 2G network, requests for a service which is only provided by the 3G network (e.g. a CS multimedia call), the network is expected to initiate a service handover to the 3G network of operator X. (Note that the serving BSC does not have the necessary information to determine that the subscriber should be handed over to the 3G network of operator Y.) |

| | | | |
|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.7.3.1.4, 4.7.4.2.2, 4.7.5.1.4, 4.7.13.4 | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ |
| ***Other comments:*** | ⌘ | If the MS behaves as proposed in this CR and a further handover to another location area or PLMN happens during the lifetime of the RR connection, the MS will<br>- in GMM state GMM-DEREGISTERED.LIMITED-SERVICE (after Attach Reject) perform a new GPRS attach;<br>- in GMM state GMM-REGISTERED.LIMITED-SERVICE (after RAU Reject or Service Reject) perform another RAU<br>if the location area and the PLMN ID is not on one of the forbidden lists. That means that PS services can be used again as soon as possible. | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

# First modified section

### 4.7.3.1.4 GPRS attach not accepted by the network

If the attach request cannot be accepted by the network, an ATTACH REJECT message is transferred to the MS. The MS receiving the ATTACH REJECT message, stops timer T3310 and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take one of the following actions depending upon the reject cause:

# 3 (Illegal MS); or

# 6 (Illegal ME)

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

If the MS is IMSI attached ~~via MM procedures~~, the MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed)

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

# 8 (GPRS services and non-GPRS services not allowed)

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. ~~The new MM state is MM IDLE.~~

The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

# 11 (PLMN not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the GPRS attach attempt counter and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 12 (Location area not allowed)

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area).

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE or optionally to GMM-DEREGISTERED.PLMN-SEARCH

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 14 (GPRS services not allowed in this PLMN)

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

A GPRS MS operating in MS operation mode A or B in network operation mode II or III, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area)

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is specified in clause 4.7.3.1.5.

# Next modified section

### 4.7.4.2.2 Network initiated GPRS detach procedure completion by the MS

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach required", the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED. The MS shall, after the completion of the GPRS detach procedure, initiate a GPRS attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

A GPRS MS operating in MS operation mode A or B in network operation mode I, which receives an DETACH REQUEST message with detach type indicating "re-attach required" or "re-attach not required" and no cause code, is only detached for GPRS services in the network.

When receiving the DETACH REQUEST message and the detach type IE indicates "IMSI detach", the MS shall not deactivate the PDP contexts. The MS shall set the MM update status to U2 NOT UPDATED. A MS in operation mode A or B in network operation mode I may send a DETACH ACCEPT message to the network, and shall re-attach to non-GPRS service by performing the combined routing area updating procedure according to clause 4.7.5.2, sending a ROUTING AREA UPDATE REQUEST message with Update type IE indicating "combined RA/LA updating with IMSI attach". A MS in operation mode C, or in MS operation mode A or B in network operation mode II or III, shall send a DETACH ACCEPT message to the network.

If the detach type IE indicates "IMSI detach", or "re-attach required" then the MS shall ignore the cause code if received.

If the detach type information element value indicates "re-attach required" or "re-attach not required" and the MS is attached for GPRS and non-GPRS services and the network operates in network operation mode I, then if in the MS the timer T3212 is not already running, the timer T3212 shall be set to its initial value and restarted.

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach not required" and the cause code is not “#2 (IMSI unknown in HLR)”, the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED.

If the detach type IE indicates "re-attach not required", then, depending on the received cause code, the MS shall act as follows:

# 2 (IMSI unknown in HLR)

The MS shall set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE. The SIM shall be considered as invalid for non-GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for GPRS services in the network.

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number.

The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM idle.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network.

# 8 (GPRS services and non-GPRS services not allowed);

~~The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and the update status to U3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2). Furthermore, it shall delete any P-TMSI, P-TMSI signature, TMSI, RAI, LAI, ciphering key sequence number and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.~~

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED.

The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

# 11 (PLMN not allowed);

The MS shall delete any RAI or LAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2). The new GMM state is GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- A GPRS MS operating in MS operation mode A or B shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 12 (Location area not allowed)

The MS shall delete any RAI, P-TMSI, P-TMSI signature GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area).

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE or optionally to GMM-DEREGISTERED.PLMN-SEARCH

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 14 (GPRS services not allowed in this PLMN)

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list.

A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area)

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

Other cause values shall not impact the update status. Further actions of the MS are implementation dependent.

# Next modified section

### 4.7.5.1.4 Normal and periodic routing area updating procedure not accepted by the network

If the routing area updating cannot be accepted, the network sends a ROUTING AREA UPDATE REJECT message to the MS. An MS that receives a ROUTING AREA UPDATE REJECT message stops timer T3330 and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take different actions depending on the received reject cause value:

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

If the MS is IMSI attached ~~via MM procedures~~, the MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

If the update type is "periodic updating" a GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

# 9 (MS identity cannot be derived by the network);

The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to clause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

# 10 (Implicitly detached);

The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

# 11 (PLMN not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and enter the state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 12 (Location area not allowed)

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the routing area updating attempt counter and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area).

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 14 (GPRS services not allowed in this PLMN)

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

If the update type is "periodic updating" a GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B in network operation mode II or III, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area)

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in clause 4.7.5.1.5.

# Next modified section

## 4.7.13.4 Service request procedure not accepted by the network

If the Service request cannot be accepted, the network returns a SERVICE REJECT message to the mobile station. An MS that receives a SERVICE REJECT message stops timer T3317. The MS shall then take different actions depending on the received reject cause value:

# 3 (Illegal MS);

# 6 (Illegal ME);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

# 9 (MS identity cannot be derived by the network);

- The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to clause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

# 10 (Implicitly detached);

- The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE 1: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

# 11 (PLMN not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and enter the state GMM-DEREGISTERED.

- The MS shall store the PLMN identity in the "forbidden PLMN list".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - A GPRS MS operating in MS operation mode A shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE.

~~- The MS shall store the PLMN identity in the "forbidden PLMN list".~~

  - The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 12 (Location area not allowed)

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

- The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~- The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

  - The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area).

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) ~~attempt counter~~ and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

- The MS shall store the LAI in the list of "forbidden location areas for roaming".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~- The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

  - The MS shall perform a PLMN selection according to 3GPP TS 23.122.

# 15 (No Suitable Cells In Location Area)

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall change to state GMM-REGISTERED.LIMITED-SERVICE~~ATTEMPTING TO UPDATE~~.

- The MS shall store the LAI in the list of "forbidden location areas for roaming".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~- The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

  - The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 40 (No PDP context activated)

- The MS shall deactivate locally all active PDP contexts and the MS shall enter the state GMM-REGISTERED.NORMAL-SERVICE. The MS may also activate PDP context(s) to replace any previously active PDP contexts.

NOTE 2: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in clause 4.7.13.5.

**3GPP TSG-CN1 Meeting #24**
**Budapest, Hungary, 13. – 17. May 2002**

***Tdoc N1-021387***
Revision of N1-021274

*CR-Form-v5*

# CHANGE REQUEST

⌘ **24.008** **CR** **628** ⌘ **rev** **1** ⌘ Current version: **4.6.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Impact of regional roaming restrictions on the MM state |
| ***Source:*** | ⌘ | Siemens AG |
| ***Work item code:*** | ⌘ | GSM/UMTS interworking |
| ***Date:*** | ⌘ | 02.05.02 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | REL-4 |

*Use one 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 one of the following releases:*
*2* *(GSM Phase 2)*
*R96* *(Release 1996)*
*R97* *(Release 1997)*
*R98* *(Release 1998)*
*R99* *(Release 1999)*
*REL-4* *(Release 4)*
*REL-5* *(Release 5)*

***Reason for change:*** ⌘

1) In R99 and Rel-4, regional roaming restrictions can be realized in shared network scenarios by means of the “equivalent PLMN list” and the (G)MM reject causes #11, #12, #13 and #15. These features, however, only allow to influence the cell and PLMN selection in idle mode. RAN3 and SA2 only recently started to study for Rel-5 the enhancements necessary to enforce regional roaming restrictions also in the connected mode. Enhancements to GERAN will not be possible before Rel-6.

Therefore, in a R99/Rel-4/Rel-5 network it may happen that an MS in MS operation mode A or B, with an ongoing CS call, is handed over to a cell in which it is rejected by the SGSN, when it tries to perform a GPRS attach, routing area update or service request procedure. (Note that an MS in MS operation mode B in GSM will change to operation mode A in UMTS, see TS 24.008, subclause 4.7.1.7 c.)

In the current version of TS 24.008 it is stated that in case of a GPRS attach, a network initiated GPRS detach, a normal or periodic routing area update, or a service request procedure, if the MS receives reject cause #11, #12, #13 or #15, it shall (among other things) perform the following actions:

- If the MS is IMSI attached via MM procedures, the MS shall set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. **The new MM state is MM IDLE.**
- Furthermore, the MS shall perform a PLMN selection (causes #11 and #13) or a cell selection (cause #12), or it shall search for a suitable cell in another location area in the same PLMN (cause #15).

That means that an MS in MS operation mode A has to drop the ongoing circuit switched call. Furthermore, an MS that is only IMSI attached for non-GPRS services will drop the ongoing circuit switched call when the subscriber tries to change to MS operation mode A and attach for GPRS services.

2) In case of receipt of a Service Reject with reject cause #15 the new GMM state should be GMM-REGISTERED.LIMITED-SERVICE instead of GMM-

| | |
|---|---|
| | REGISTERED.ATTEMPTING-TO-UPDATE. |
| ***Summary of change:*** ⌘ | 1) In case of a GPRS attach, a network initiated GPRS detach, a normal or periodic routing area update, or a service request procedure:<br>if the MS is in MS operation mode A and an RR connection exists, the MS shall after receipt of one of the reject causes #11, #12, #13 and #15 postpone the actions specified for the MM entity until the RR connection is released.<br><br>2) The new GMM state after receipt of a Service Reject with reject cause #15 is changed to GMM-REGISTERED.LIMITED-SERVICE.<br><br>3) A clarification is added that the new GMM state after receipt of a network initiated Detach REQUEST message with reject cause #11 is GMM-REGISTERED.<br><br>4) The statement "The new MM state is MM IDLE." is deleted for GMM reject causes #3, #6 and #8 to allow the MS to continue an ongoing emergency call. |
| ***Consequences if not approved:*** ⌘ | The MS will loose ongoing circuit-switched calls, if it is operating in MS operation mode A or B and handed over to a cell in which the MS is operating in MS operation mode A and for which regional roaming restrictions apply.<br><br>This scenario is supposed to happen frequently e.g. in the following case: Operators X and Y have separate 3G networks. There is a roaming agreement allowing subcribers of operator Y to roam in the 2G network of operator X, but not in his 3G network.<br>If a subscriber of operator Y, while roaming in the 2G network, requests for a service which is only provided by the 3G network (e.g. a CS multimedia call), the network is expected to initiate a service handover to the 3G network of operator X. (Note that the serving BSC does not have the necessary information to determine that the subscriber should be handed over to the 3G network of operator Y.) |

| | | | |
|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.7.3.1.4, 4.7.4.2.2, 4.7.5.1.4, 4.7.13.4 | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ |
| ***Other comments:*** | ⌘ | If the MS behaves as proposed in this CR and a further handover to another location area or PLMN happens during the lifetime of the RR connection, the MS will<br>- in GMM state GMM-DEREGISTERED.LIMITED-SERVICE (after Attach Reject) perform a new GPRS attach;<br>- in GMM state GMM-REGISTERED.LIMITED-SERVICE (after RAU Reject or Service Reject) perform another RAU<br>if the location area and the PLMN ID is not on one of the forbidden lists. That means that PS services can be used again as soon as possible. | |

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

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

# First modified section

### 4.7.3.1.4 GPRS attach not accepted by the network

If the attach request cannot be accepted by the network, an ATTACH REJECT message is transferred to the MS. The MS receiving the ATTACH REJECT message, stops timer T3310 and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take one of the following actions depending upon the reject cause:

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

If the MS is IMSI attached ~~via MM procedures~~, the MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

# 8 (GPRS services and non-GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED. ~~The new MM state is MM IDLE.~~

The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

# 11 (PLMN not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2), shall reset the GPRS attach attempt counter and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE or optionally to GMM-DEREGISTERED.PLMN-SEARCH.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

A GPRS MS operating in MS operation mode A or B in network operation mode II or III, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED(and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is specified in subclause 4.7.3.1.5.

# Next modified section

### 4.7.4.2.2 Network initiated GPRS detach procedure completion by the MS

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach required", the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED. The MS shall, after the completion of the GPRS detach procedure, initiate a GPRS attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

A GPRS MS operating in MS operation mode A or B in network operation mode I, which receives an DETACH REQUEST message with detach type indicating "re-attach required" or "re-attach not required" and no cause code, is only detached for GPRS services in the network.

When receiving the DETACH REQUEST message and the detach type IE indicates "IMSI detach", the MS shall not deactivate the PDP contexts. The MS shall set the MM update status to U2 NOT UPDATED. A MS in operation mode A or B in network operation mode I may send a DETACH ACCEPT message to the network, and shall re-attach to non-GPRS service by performing the combined routing area updating procedure according to subclause 4.7.5.2, sending a ROUTING AREA UPDATE REQUEST message with Update type IE indicating "combined RA/LA updating with IMSI attach". A MS in operation mode C, or in MS operation mode A or B in network operation mode II or III, shall send a DETACH ACCEPT message to the network.

If the detach type IE indicates "IMSI detach", or "re-attach required" then the MS shall ignore the cause code if received.

If the detach type information element value indicates "re-attach required" or "re-attach not required" and the MS is attached for GPRS and non-GPRS services and the network operates in network operation mode I, then if in the MS the timer T3212 is not already running, the timer T3212 shall be set to its initial value and restarted.

When receiving the DETACH REQUEST message and the detach type IE indicates "re-attach not required" and the cause code is not "#2 (IMSI unknown in HLR)", the MS shall deactivate the PDP contexts and deactivate the logical link(s), if any. The MS shall then send a DETACH ACCEPT message to the network and shall change state to GMM-DEREGISTERED.

If the detach type IE indicates "re-attach not required", then, depending on the received cause code, the MS shall act as follows:

# 2 (IMSI unknown in HLR);

The MS shall set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE. The SIM shall be considered as invalid for non-GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for GPRS services in the network.

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence

number. The new GMM state is GMM-DEREGISTERED. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed.

A GPRS MS operating in MS operation mode A or B shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM idle.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network.

# 8 (GPRS services and non-GPRS services not allowed);

~~The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and the update status to U3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2). Furthermore, it shall delete any P-TMSI, P-TMSI signature, TMSI, RAI, LAI, ciphering key sequence number and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.~~

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The new GMM state is GMM-DEREGISTERED.

The MS shall set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. The SIM shall be considered as invalid for GPRS and non-GPRS services until switching off or the SIM is removed.

# 11 (PLMN not allowed);

The MS shall delete any RAI or LAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2). The new GMM state is GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- A GPRS MS operating in MS operation mode A or B shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED(and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE or optionally to GMM-DEREGISTERED.PLMN-SEARCH.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list.

A GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED(and shall store it according to clause 4.1.3.2) and shall reset the attach attempt counter. The state is changed to GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

Other cause values shall not impact the update status. Further actions of the MS are implementation dependent.

# Next modified section

#### 4.7.5.1.4 Normal and periodic routing area updating procedure not accepted by the network

If the routing area updating cannot be accepted, the network sends a ROUTING AREA UPDATE REJECT message to the MS. An MS that receives a ROUTING AREA UPDATE REJECT message, stops timer T3330, and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take different actions depending on the received reject cause value:

# 3 (Illegal MS);

# 6 (Illegal ME);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

If the MS is IMSI attached ~~via MM procedures~~, the MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

If the update type is "periodic updating" a GPRS MS operating in MS operation mode A or B in networkoperation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

# 9 (MS identity cannot be derived by the network);

The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to subclause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

# 10 (Implicitly detached);

The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

# 11 (PLMN not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMN list".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the routing area updating attempt counter and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

- The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list. A GPRS MS operating in MS operation mode C shall perform a PLMN selection instead of a cell selection.

If the update type is "periodic updating" a GPRS MS operating in MS operation mode A or B in network operation mode I shall set the timer T3212 to its initial value and restart it, if it is not already running.

A GPRS MS operating in MS operation mode A or B in network operation mode II or III, is still IMSI attached for CS services in the network.

# 15 (No Suitable Cells In Location Area);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2) shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

- If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in subclause 4.7.5.1.5.

# Next modified section

## 4.7.13.4 Service request procedure not accepted by the network

~~—~~If the Service request cannot be accepted, the network returns a SERVICE REJECT message to the mobile station. An MS that receives a SERVICE REJECT message stops timer T3317. The MS shall then take different actions depending on the received reject cause value:

# 3 (Illegal MS); or

# 6 (Illegal ME);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number and shall consider the SIM as invalid for GPRS services until switching off or the SIM is removed.

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number. ~~The new MM state is MM IDLE.~~ The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM is removed.

# 7 (GPRS services not allowed);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

# 9 (MS identity cannot be derived by the network);

- The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to subclause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

# 10 (Implicitly detached);

- The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

# 11 (PLMN not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED.

- The MS shall store the PLMN identity in the "forbidden PLMN list".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - A GPRS MS operating in MS operation mode A shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ciphering key sequence number. The new MM state is MM IDLE.

~~The MS shall store the PLMN identity in the "forbidden PLMN list".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 12 (Location area not allowed);

- The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

- The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".~~

  - The MS shall perform a cell selection according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 13 (Roaming not allowed in this location area);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) ~~attempt counter~~ and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

- The MS shall store the LAI in the list of "forbidden location areas for roaming".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

- The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

# 15 (No Suitable Cells In Location Area);

- The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-REGISTERED.LIMITED-SERVICE~~ATTEMPTING TO UPDATE~~.

- The MS shall store the LAI in the list of "forbidden location areas for roaming".

- If no RR connection exists, the MS shall perform the following additional actions immediately. If the MS is operating in MS operation mode A and an RR connection exists, the MS shall perform these actions when the RR connection is subsequently released:

  - If the MS is IMSI attached ~~via MM procedures~~, the MS shall ~~in addition~~ set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

~~The MS shall store the LAI in the list of "forbidden location areas for roaming".~~

  - The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 03.22 and 3GPP TS 25.304.

# 40 (No PDP context activated)

- The MS shall deactivate locally all active PDP contexts and the MS shall enter the state GMM-REGISTERED.NORMAL-SERVICE. The MS may also activate PDP context(s) to replace any previously active PDP contexts.

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP context(s) automatically.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in subclause 4.7.13.5.