CR-Form-v3

CHANGE REQUEST

⌘   **24.008 CR**   ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

*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 ☐   Core Network ☐

Title: ⌘	Modification to MS's MM states to enable LCS signalling on RR layer	
Source: ⌘	Nokia	
Work item code: ⌘	LCS	***Date:*** ⌘ 07.03.2001
Category: ⌘	**A**	***Release:*** ⌘ R99

Use <u>one</u> of the following categories:
F (essential correction)
A (corresponds to a correction in an earlier release)
B (Addition of feature),
C (Functional modification of feature)
D (Editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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

Reason for change: ⌘	LCS communication occurs in RR layer. For MT-LR/NI-LR case the MM layer is not active (from MS point of view) after authentication which causes that RR connection will be closed even if RR is needed for LCS signalling. The connection is closed by MS via T3240 timer within 10 seconds after last MM interaction. The LCS signalling may take longer than 10 seconds. This correction enables to stop T3240 timer and transit to a new MM state when RR layer sends indication to MM layer using RR-No-Abort-Ind (no abort) RR-SAP service primitive. The return to the normal MM operation occurs when RR-No-Abort-Ind (abort allowed) RR-SAP service primitive is received from RR layer. A new timer T32xx is added to quard the new MM state. This change together with CR to 04.07 (addition of RR-No-Abort-Ind primitive at RR-SAP in MS side) will correct the problem.
Summary of change: ⌘	The definition of a new MM state RR CONNECTION RELEASE NOT ALLOWED is added and the state transitions to/from the new state are defined. A new timer T32xx is defined.
Consequences if not approved: ⌘	RR connection is released by MS even if the RR is needed for LCS signalling

Clauses affected: ⌘	4.1.2.1.1, 4.2, 4.2.6 (added), 4.2.7 (added), 11.2, 11.2.x (added)
Other specs affected: ⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments: ⌘	This CR is coupled with CR to 04.07 (tdoc NP-010099 & NP-010100).

********************* First Modified Section **************************

4.1.2.1 MM sublayer states in the mobile station

In this section, the possible states for the MM sublayer in the mobile station is described. In figure 4.1/GSM 04.08 an overview of the MM sublayer protocol is given.

4.1.2.1.1 Main states

0 NULL

The mobile station is inactive (e.g. power down). Important parameters are stored. Only manual action by the user may transfer the MM sublayer to another state.

3 LOCATION UPDATING INITIATED

A location updating procedure has been started and the MM awaits a response from the network. The timer T3210 is running.

5 WAIT FOR OUTGOING MM CONNECTION

The MM connection establishment has been started, and the MM awaits a response from the network. The timer T3230 is running.

6 MM CONNECTION ACTIVE

The MM sublayer has a RR connection to its peer entity on the network side. One or more MM connections are active.

7 IMSI DETACH INITIATED

The IMSI detach procedure has been started. The timer T3220 is running.

8 PROCESS CM SERVICE PROMPT

The MM sublayer has a RR connection to its peer entity on the network side. The Mobile Station has received a CM SERVICE PROMPT message but has not yet responded $(CCBS)$.

9 WAIT FOR NETWORK COMMAND

The MM sublayer has a RR connection to its peer entity in the network, but no MM connection is established. The mobile station is passive, awaiting further commands from the network. The timer T3240 may be running.

10 LOCATION UPDATE REJECTED

A location updating procedure has been rejected and RR connection release is awaited. The timer T3240 is running.
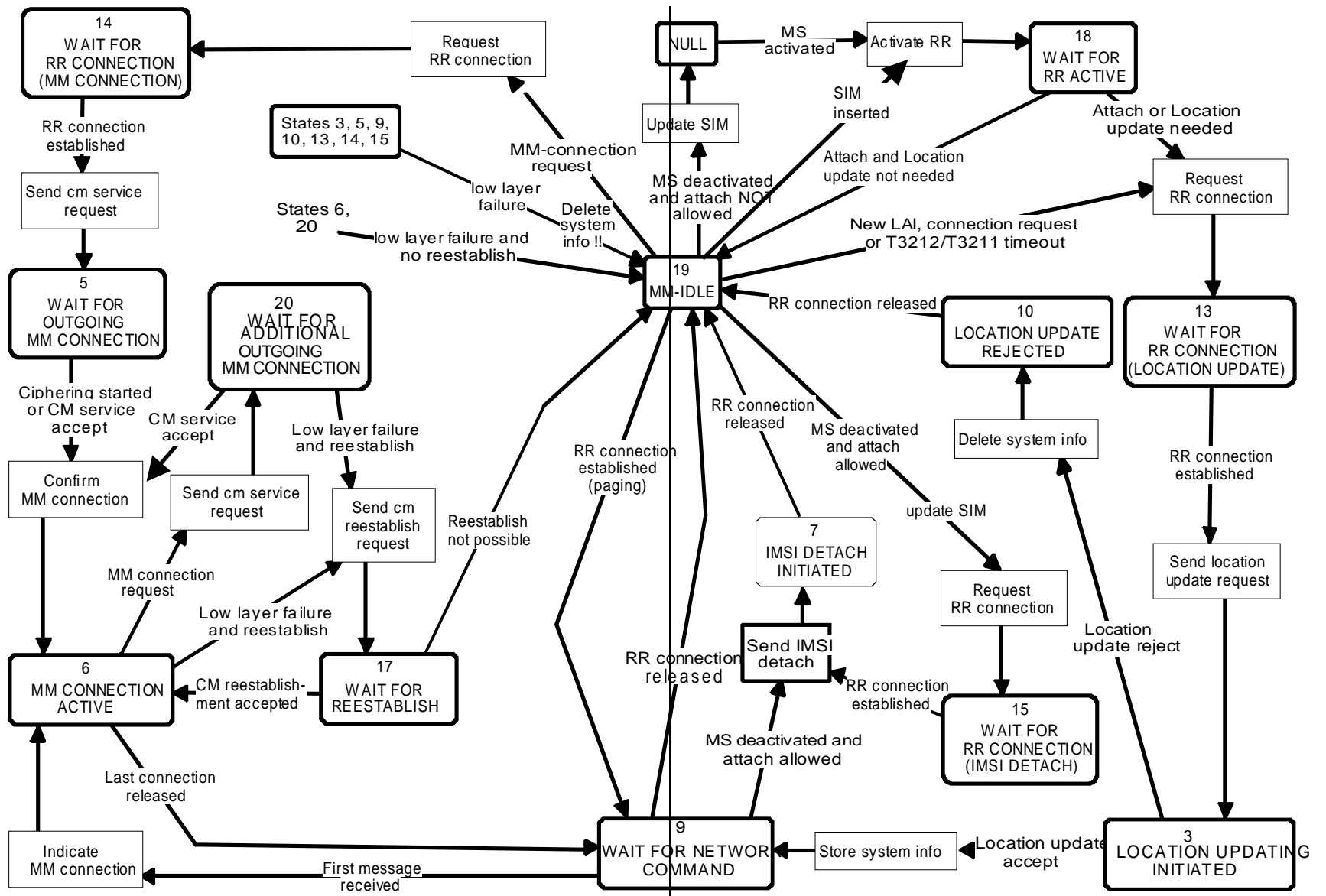
States 3, 5, 9, 10, 13, 14, 15

States 6, 20

14 WAIT FOR RR CONNECTION (MM CONNECTION)

Request RR connection

NULL

MS activated

Activate RR

18 WAIT FOR RR ACTIVE

SIM inserted

Update SIM

MM-connection request

low layer failure

Delete system info !!

MS deactivated and attach NOT allowed

Attach and Location update not needed

Attach or Location update needed

RR connection established

low layer failure and no reestablish

New LAI, connection request or T3212/T3211 timeout

Request RR connection

Send cm service request

19 MM-IDLE

RR connection released

10 LOCATION UPDATE REJECTED

13 WAIT FOR RR CONNECTION (LOCATION UPDATE)

5 WAIT FOR OUTGOING MM CONNECTION

20 WAIT FOR ADDITIONAL OUTGOING MM CONNECTION

Delete system info

Ciphering started or CM service accept

CM service accept

Low layer failure and reestablish

RR connection released

RR connection released

MS deactivated and attach allowed

update SIM

RR connection established

Confirm MM connection

Send cm service request

Send cm reestablish request

RR connection established (paging)

7 IMSI DETACH INITIATED

Send location update request

MM connection request

Low layer failure and reestablish

Reestablish not possible

RR connection released

Send IMSI detach

Request RR connection

Location update reject

6 MM CONNECTION ACTIVE

CM reestablishment accepted

17 WAIT FOR REESTABLISH

MS deactivated and attach allowed

RR connection established

15 WAIT FOR RR CONNECTION (IMSI DETACH)

Last connection released

Indicate MM connection

First message received

9 WAIT FOR NETWORK COMMAND

Store system info

Location update accept

3 LOCATION UPDATING INITIATED

Figure 4.1a / GSM 04.08: Overview mobility management protocol / MS Side
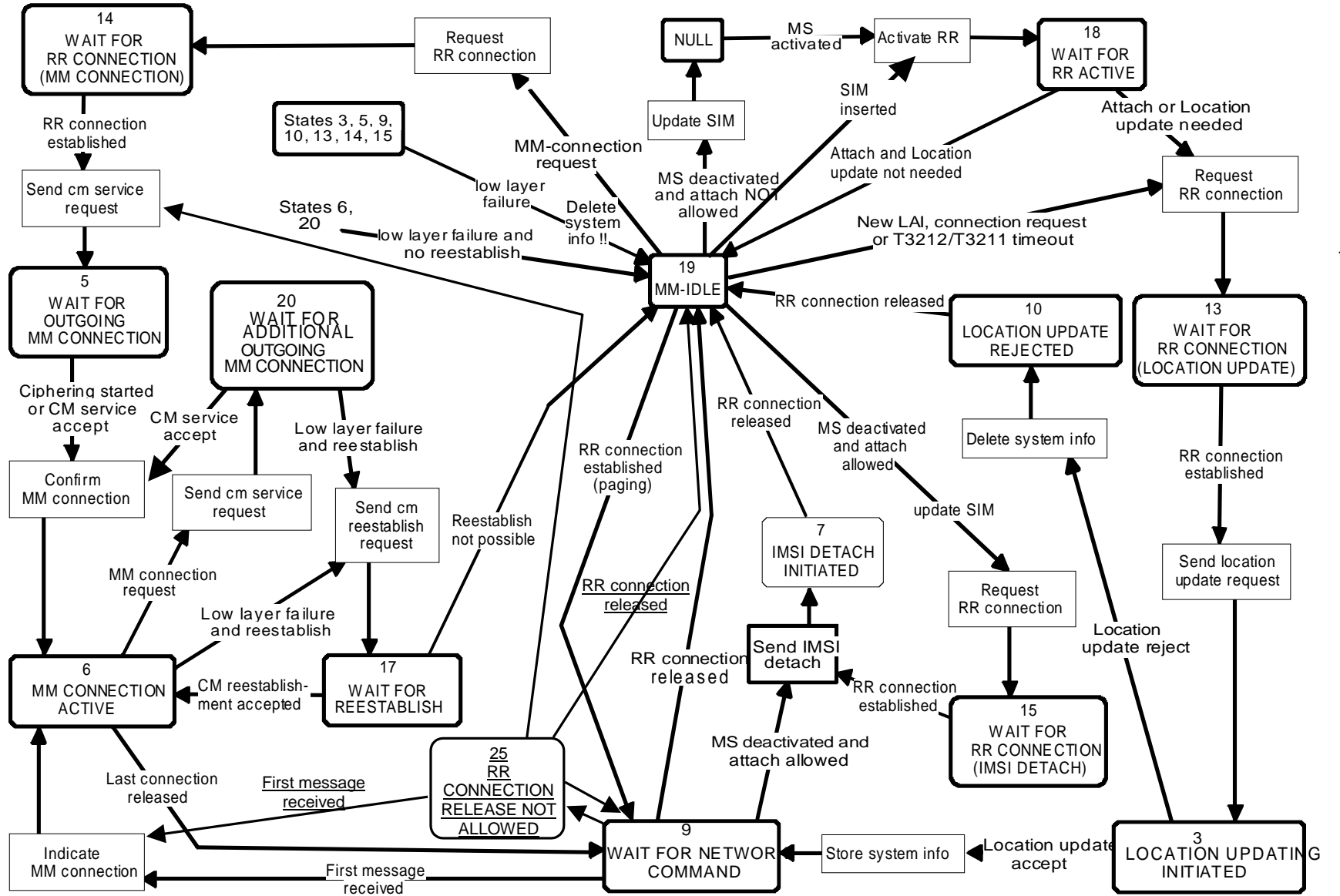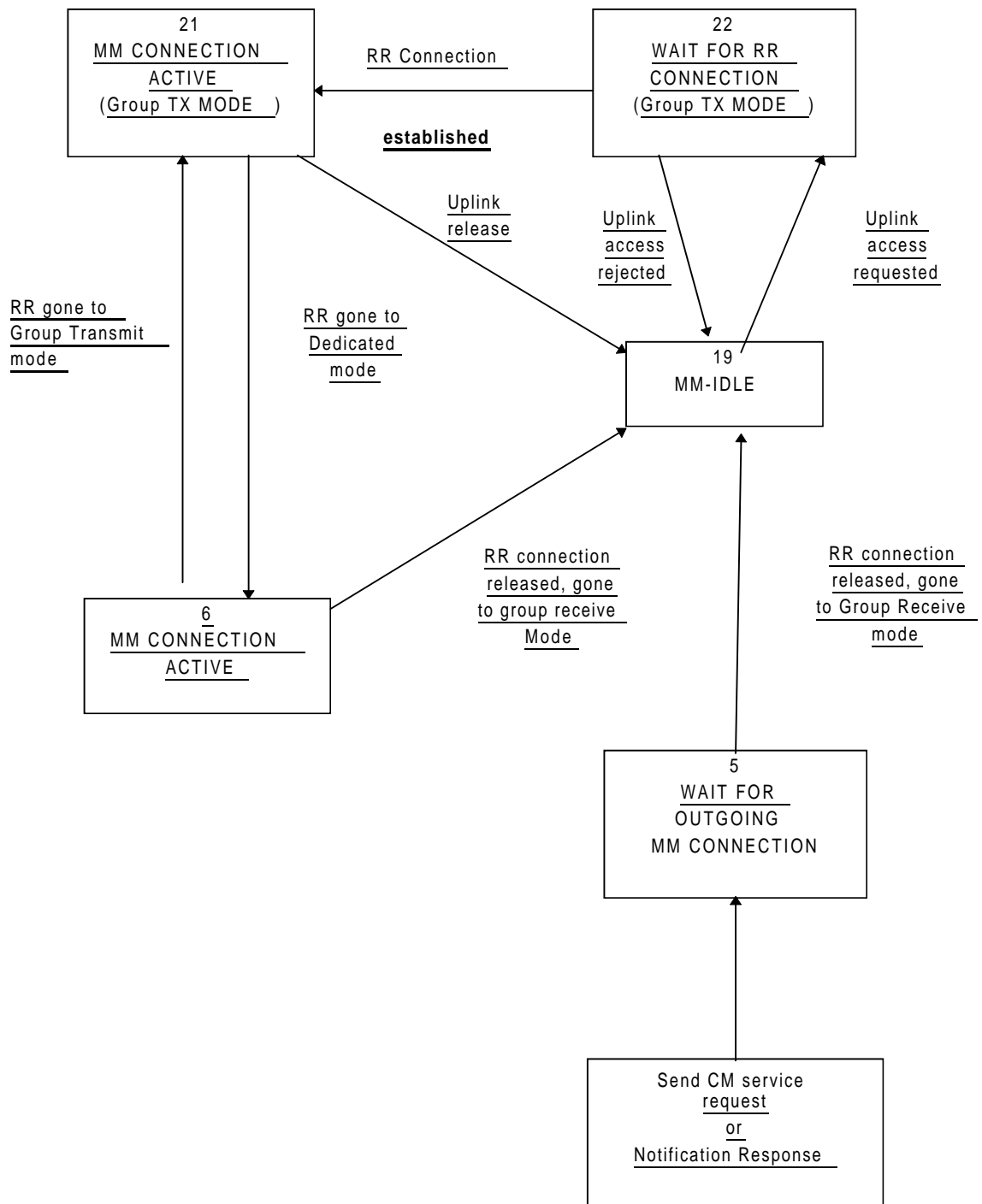
Additions to Figure 4.1.a/GSM 04.08

13. WAIT FOR RR CONNECTION (LOCATION UPDATING)

The MM sublayer has requested RR connection establishment for starting the location updating procedure.

14. WAIT FOR RR CONNECTION (MM CONNECTION)

The MM sublayer has requested RR connection establishment for dedicated mode for starting the MM connection establishment.

15. WAIT FOR RR CONNECTION (IMSI DETACH)

The MM sublayer has requested RR connection establishment for starting the IMSI detach procedure.

17. WAIT FOR REESTABLISH

A lower layer failure has occurred and re-establishment may be performed from the disturbed CM layer entities.

18. WAIT FOR RR ACTIVE

The MM sublayer has requested activation of the RR sublayer.

19. MM IDLE

There is no MM procedure running and no RR connection exists except that a local MM context may exist when the RR sublayer is in Group Receive mode. This is a compound state, and the actual behaviour of the mobile station to Connection Management requests is determined by the actual substate as described hereafter.

20. WAIT FOR ADDITIONAL OUTGOING MM CONNECTION.

The MM connection establishment for an additional MM connection has been started, and the MM awaits response from the network.

21. MM CONNECTION ACTIVE (GROUP TRANSMIT MODE)

(Only applicable for mobile stations supporting VGCS talking:) The MM sublayer has a RR connection on the VGCS channel to its peer entity on the network side. Only one MM connection is active.

22. WAIT FOR RR CONNECTION (GROUP TRANSMIT MODE)

(Only applicable for mobile stations supporting VGCS talking:) The MM sublayer has requested to perform an uplink access on the VGCS channel.

23. LOCATION UPDATING PENDING

(Only applicable for GPRS MS operation modes A and B; not shown in figure 4.1a) A location updating has been started using the combined GPRS routing area updating procedure.

24. IMSI DETACH PENDING

(Only applicable for GPRS MS operation modes A and B; not shown in figure 4.1a) An IMSI detach for non-GPRS services has been started using the combined GPRS detach procedure at not switching off.

25. RR CONNECTION RELEASE NOT ALLOWED

(Only applicable for MSs supporting LCS) There is no MM procedure running but RR connection exists. The timer T32xx is running.

4.2 Behaviour of the MS in MM Idle state, <u>WAIT FOR NETWORK COMMAND state, RR CONNECTION RELEASE NOT ALLOWED state,</u> GMM-DEREGISTERED state and GMM-REGISTERED state

In this section, the detailed behaviour of the MS in the main states MM IDLE, <u>WAIT FOR NETWORK COMMAND, RR CONNECTION RELEASE NOT ALLOWED,</u>GMM-DEREGISTERED and GMM-REGISTERED is described. Sections 4.2.1 to 4.2.3 refer to the state MM IDLE, whereas section 4.2.4 and section 4.2.5 refer to the states GMM-DEREGISTERED and GMM-REGISTERED, respectively.<u> Section 4.2.6 and section 4.2.7 refer to states WAIT FOR NETWORK COMMAND and RR CONNECTION RELEASE NOT ALLOWED, respectively.</u>

The MM IDLE state is entered when none of the MM procedures are running and no RR connection exists. It is left when one of the MM procedures are triggered or a RR connection is established.

The specific behaviour in the MM IDLE state depends on the service state of the mobile station as described in section 4.1.2.1.2. The service state depends in particular on the update status which is defined in section 4.1.2.2.

How an appropriate service state is chosen after power on is described in section 4.2.1, and the specific behaviour of the mobile station in MM IDLE state is described in section 4.2.2. The service state chosen when the MM IDLE state is returned to from any state except NULL state is described in 4.2.3.

It should be noted that transitions between the various MM idle states are caused by (e.g.):

- results of procedures on RR connected mode (see section 4.2.3);

- insertion or removal of the SIM;

- cell selection/reselection (see also GSM 03.22);

- PLMN search;

- loss of coverage.

How various MM procedures affects the service state and the update status is described in the detailed descriptions of the procedures in sections 4.3 to 4.5.

********************** **First Added Section** **************************

4.2.6 Behaviour of the MS supporting LCS in MM WAIT FOR NETWORK COMMAND state

The following, additional, requirements are only applicable for MS supporting LCS.

When in state WAIT FOR NETWORK COMMAND, RR CONNECTION RELEASE NOT ALLOWED state is entered, if RR-No-Abort-Ind (no abort) has been received (in this or any of the other MM states).

In above state transition, timer T3240 is stopped and reset but not restarted. Timer T32xx shall be started.

4.2.7 Behaviour of the MS supporting LCS in MM RR CONNECTION RELEASE NOT ALLOWED state

The following requirements are only applicable for MS supporting LCS.

When in state RR CONNECTION RELEASE NOT ALLOWED;

if a request for MM connection establishment is received:

- timer T32xx is stopped and reset but not restarted and;

- CM SERVICE REQUEST is sent and;

- state WAIT FOR OUTGOING MM CONNECTION is entered

if RR-No-Abort-Ind (abort allowed) is received:

- timer T32xx is stopped and reset but not restarted and;

- timer T3240 is started and;

- state WAIT FOR NETWORK COMMAND is entered

if timer T32xx expires:

- timer T32xx is reset but not restarted and;

- RR connection is released and;

- MM IDLE state is entered

if a CM message is received from the network:

- timer T32xx is stopped and reset but not restarted and;

- MM CONNECTION ACTIVE state is entered (via Indicate MM connection sub-state).

if a radio channel release is initiated by the network:

- timer T32xx is reset but not restarted and;

- RR connection is released and;

- MM IDLE state is entered.

11.2 Timers of mobility management

Table 11.1/3GPP TS 24.008: Mobility management timers - MS-side

TIMER NUM.	MM STAT AT	TIME OUT VAL.	CAUSE FOR START	NORMAL STOP	AT THE EXPIRY
T3210	3	20s	- LOC_UPD_REQ sent	- LOC_UPD_ACC - LOC_UPD_REJ - AUTH_REJ - Lower layer failure	Start T3211
T3211	1 2	15s	- LOC_UPD_REJ with cause#17 netw. failure - lower layer failure or RR conn. released after RR conn. abort during loc. updating	- Time out - cell change - request for MM connection establishment - change of LA	Restart the Location update proc.
T3212	1, 2	Note 1	- termination of MM service or MM signalling	- initiation of MM service or MM signalling	initiate periodic updating
T3213	1 2 11	4s	- location updating failure	- expiry - change of BCCH parameter	new random attempt
T3214	3 5 7	20s	AUTHENT FAILURE Cause = MAC failure sent	AUTHENT REQ - received	Consider the network as 'false' (see 4.3.2.6.1)
T3216	3 5 7	15s	AUTHENT FAILURE Cause = Synch failure sent	AUTHENT REQ received	Consider the network as 'false' (see 4.3.2.6.1)
T3220	7	5s	- IMSI DETACH	- release from RM-sublayer	enter Null or Idle, ATTEMPTING TO UPDATE
T3230	5	15s	- CM SERV REQ CM REEST REQ	- Cipher mode setting - CM SERV REJ - CM SERV ACC	provide release ind.
T3240	9 10	10s	see section 11.2.1	see section 11.2.1	abort the RR connection
T32xx	25	300s	see section 11.2.x	See section 11.2.x	abort the RR connection

NOTE 1: The timeout value is broadcasted in a SYSTEM INFORMATION message

Table 11.2/3GPP TS 24.008: Mobility management timers - network-side

TIMER NUM.	MM ST AT	TIME OUT VAL.	CAUSE FOR START	NORMAL STOP	AT THE EXPIRY	AT THE SECOND EXPIRY
T3250	6	12s	TMSI-REAL-CMD or LOC UPD ACC with new TMSI sent	TMSI-REALL-COM received	Optionally Release RR connection	
T3255		Note	LOC UPD ACC sent with"Follow on Proceed"	CM SERVICE REQUEST	Release RR Connection or use for mobile station terminating call	
T3260	5	12s	AUTHENT-REQUEST sent	AUTHENT-RESPONSE received AUTHENT-FAILURE received	Optionally Release RR connection	
T3270	4	12s	IDENTITY REQUEST sent	IDENTITY RESPONSE received	Optionally Release RR connection	

NOTE 2:   The value of this timer is not specified by this recommendation.

********************* **Next Added Section** **************************

11.2.x   Timer T32xx

Timer T32xx is started in the mobile station when entering from WAIT FOR NETWORK COMMAND state to RR CONNECTION RELEASE NOT ALLOWED state.

If timer T32xx did not expire in state RR CONNECTION RELEASE NOT ALLOWED, the timer T32xx is stopped and reset (but not started) before leaving RR CONNECTION RELEASE NOT ALLOWED state.

If timer T32xx expires:

- timer T32xx is reset but not restarted and;

- RR connection is released and;

- transition from RR CONNECTION RELEASE NOT ALLOWED state to MM IDLE state is performed.