3GPP TSG CN Plenary **Tdoc NP-000671**
Meeting #10, Bangkok, Thailand
6th – 8th December 2000

Source: **TSG CN WG 1**

Title: **CRs to R99 Work Item GSM-UMTS interworking**

Agenda item: **7.16**

Document for: **APPROVAL**

Introduction:

This document contains 20 CRs on **R99** Work Item **"GSM-UMTS interworking"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #10 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.009	013		N1-001174	R99	GSM to UMTS Handover: Directed Retry	F	3.4.0
23.009	014		N1-001175	R99	GSM to UMTS Handover: MAP parameter Target	F	3.4.0
23.009	020	1	N1-001372	R99	Indication of Intra-MSC Intersystem handover	F	3.4.0
24.007	028		N1-001256	R99	Alignment of 24.007 to other specs	F	3.5.0
23.122	013		N1-001237	R99	Alignment of figure 2a with PLMN selection for	F	3.4.2
24.008	240	2	N1-001337	R99	Correction on TFT setting condition	F	3.5.0
24.008	317		N1-001395	Rel-4	Correction on TFT setting condition	A	4.0.0
24.008	282		N1-001247	R99	Description of Timer T3317on expiry	F	3.5.0
24.008	283		N1-001248	REL-4	Description Of Timer T3317 on expiry	A	4.0.0
24.008	285	2	N1-001404	R99	Removal of "recently deactivated" condition for	F	3.5.0
24.008	286	2	N1-001405	Rel-4	Removal of "recently deactivated" condition for	A	4.0.0
23.122	012		N1-001236	R99	Restoration of figure A.1	F	3.4.2
24.008	284		N1-001250	R99	RR connection replaced with PS signalling	F	3.5.0
24.008	323		N1-001410	Rel-4	RR connection replaced with PS signalling	A	4.0.0
24.007	027		N1-001246	R99	Updating CS/PS protocol architecture figure with	F	3.5.0
23.009	017	3	N1-001408	R99	Missing Subsequent Handover scenarios	F	3.4.0
23.009	016	1	N1-001347	R99	Subsequent Handover procedure corrections	F	3.4.0
23.009	021	1	N1-001403	R99	UMTS to GSM handover: Directed Retry	F	3.4.0
24.008	294	1	N1-001361	R99	Updating of Bearer Capability IE	F	3.5.0
24.008	295	1	N1-001362	REL-4	Updating of Bearer Capability IE	A	4.0.0

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001174

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **013** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	GSM to UMTS Handover: Directed Retry
Source:	⌘	Ericsson
Work item code:	⌘	GSM UMTS interworking
Date:	⌘	2000-11-02
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	Directed retry in the case of inter-system handover and SRNS relocation is marked as FFS. In GSM, all procedures to execute directed retry are already defined. This contribution adds the text to clarify directed retry for inter-system handover from GSM to UMTS. Directed retry for inter-system handover from UMTS to GSM and SRNS relocation are FFS.
Summary of change:	⌘	A text has been added to clarify Directed Retry in case of GSM to UMTS HO.
Consequences if not approved:	⌘	We would miss a description of the DR in the 23.009.

Clauses affected:	⌘	14.2		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	-
Other comments:	⌘			

14 Directed retry handover

[Directed retry in the cases of inter-system handover UMTS to GSM and SRNS relocation is FFS]

14.1 GSM handover

The directed retry procedure allows the network to select the optimum cell for the Mobile Station. The process of directed retry involves the assignment of a Mobile Station to a radio channel on a cell other than the serving cell. This process is triggered by the assignment procedures, as described in GSM 08.08 [5], and employs internal or external handover procedures as described in clauses 6 and 7. The successful procedure for a directed retry is as shown in figure 40 and as described below.

If during the assignment phase, as represented by the A-ASSIGNMENT-REQUEST message, a handover becomes necessary, due to either radio conditions or congestion, then the Mobile Station may be handed over to a different cell. When the decision has been made to handover the MS the BSS-A may send an A-ASSIGNMENT-FAILURE message, indicating 'directed retry', before sending the A-HANDOVER-REQUIRED message to MSC-A, indicating 'directed retry'. However BSS-A may alternatively send the A-HANDOVER-REQUIRED message, indicating 'directed retry', without sending the A-ASSIGNMENT-FAILURE message. Other cause values may be used instead of "Directed Retry" in the A-HANDOVER-REQUIRED message, this will allow the MSC to take different actions dependent on the received cause. Upon receipt of the A-HANDOVER-REQUIRED message from BSS-A, then MSC-A shall initiate the handover as described in clauses 6 and 7. No resources shall be cleared in the MSC-A or BSS-A for this connection.

After receipt of the A-HANDOVER-COMPLETE message from BSS-B the assignment procedure shall be considered to be complete and the resources on BSS-A shall be cleared.

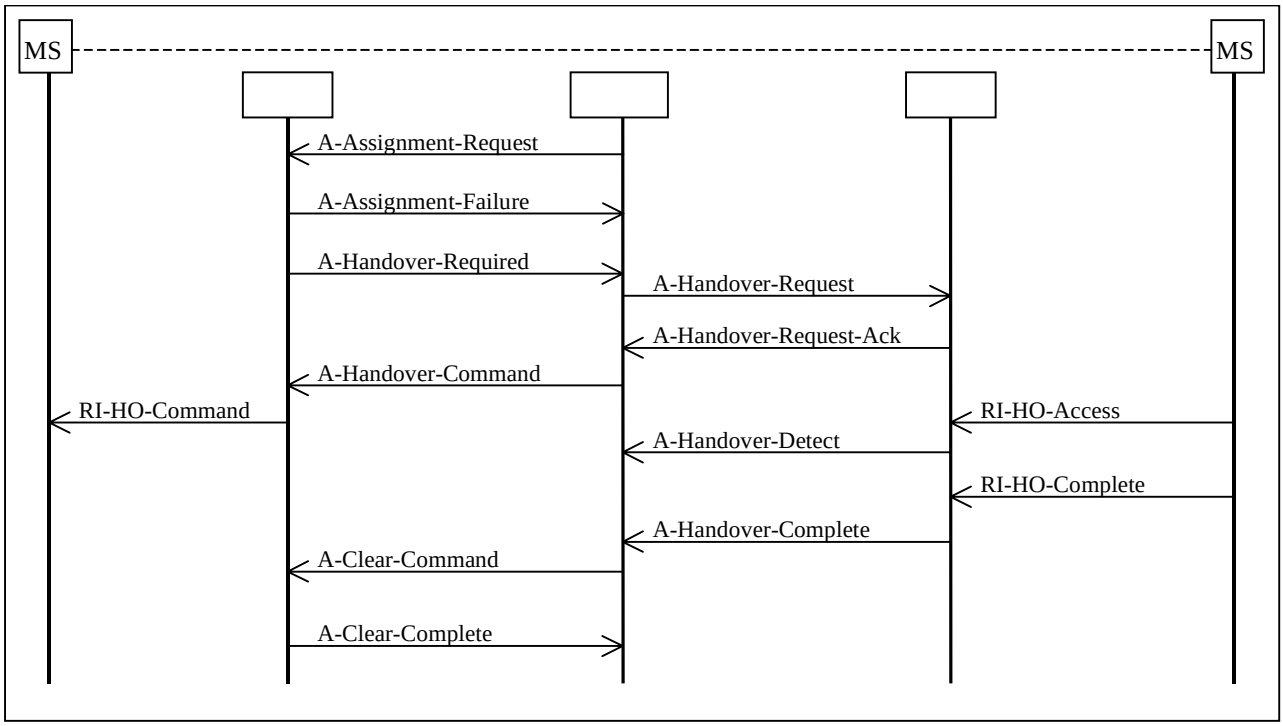

Figure 40: Example of a Directed Retry Intra-MSC Handover Procedure

If a failure occurs during the handover attempt, for example A-HANDOVER-FAILURE returned from BSS-A or BSS-B, then MSC-A will terminate the handover to BSS-B. Under these conditions MSC-A may optionally take one of a number of actions:

i) retry the handover to the same cell;

ii) select the next cell from the list contained in the A-HANDOVER-REQUIRED message and attempt a handover to the new cell;

iii) send an A-HANDOVER-REQUIRED-REJECT to BSS-A, if an A-HANDOVER-COMMAND has not already been sent;

iv) retry the assignment procedure to BSS-A, if the failure message was returned from BSS-A. This option is additional to those for normal handover;

v) Clear the complete call.

The procedures for Inter-MSC handover are also applicable to the directed retry process. If an Inter-MSC handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the A-HO-COMPLETE included in the MAP-SEND-END-SIGNAL request.

14.2 GSM to UMTS handover

The directed retry procedure allows the network to select the optimum cell for the UE/MS. The process of directed retry involves the assignment of a UE/MS to a radio channel on a cell other than the serving cell. This process is triggered by the assignment procedures, as described in GSM 08.08 [5], and employs internal or external GSM to UMTS handover procedures as described in clauses 6.2.2 and 8.2. The successful procedure for a directed retry in case of an intra-3G_MSC GSM to UMTS handover is as shown in figure 40a and as described below.

If during the assignment phase, as represented by the A-ASSIGNMENT-REQUEST message, a GSM to UMTS handover becomes necessary, due to either radio conditions or congestion, then the UE/MS may be handed over to a UMTS cell. When the decision has been made to handover the UE/MS the BSS-A may send an A-ASSIGNMENT-FAILURE message, indicating 'directed retry', before sending the A-HANDOVER-REQUIRED message to 3G_MSC-A, indicating 'directed retry'. However BSS-A may alternatively send the A-HANDOVER-REQUIRED message, indicating 'directed retry', without sending the A-ASSIGNMENT-FAILURE message. Other cause values may be used instead of "Directed Retry" in the A-HANDOVER-REQUIRED message, this will allow the 3G_MSC to take different actions dependent on the received cause. Upon receipt of the A-HANDOVER-REQUIRED message from BSS-A, then 3G_MSC-A shall initiate the GSM to UMTS handover as described in clauses 6.2.2 and 8.2. No resources shall be cleared in the 3G_MSC-A or BSS-A for this connection.

After receipt of the Iu-RELOCATION-COMPLETE message from RNS-B the assignment procedure shall be considered to be complete and the resources on BSS-A shall be cleared.

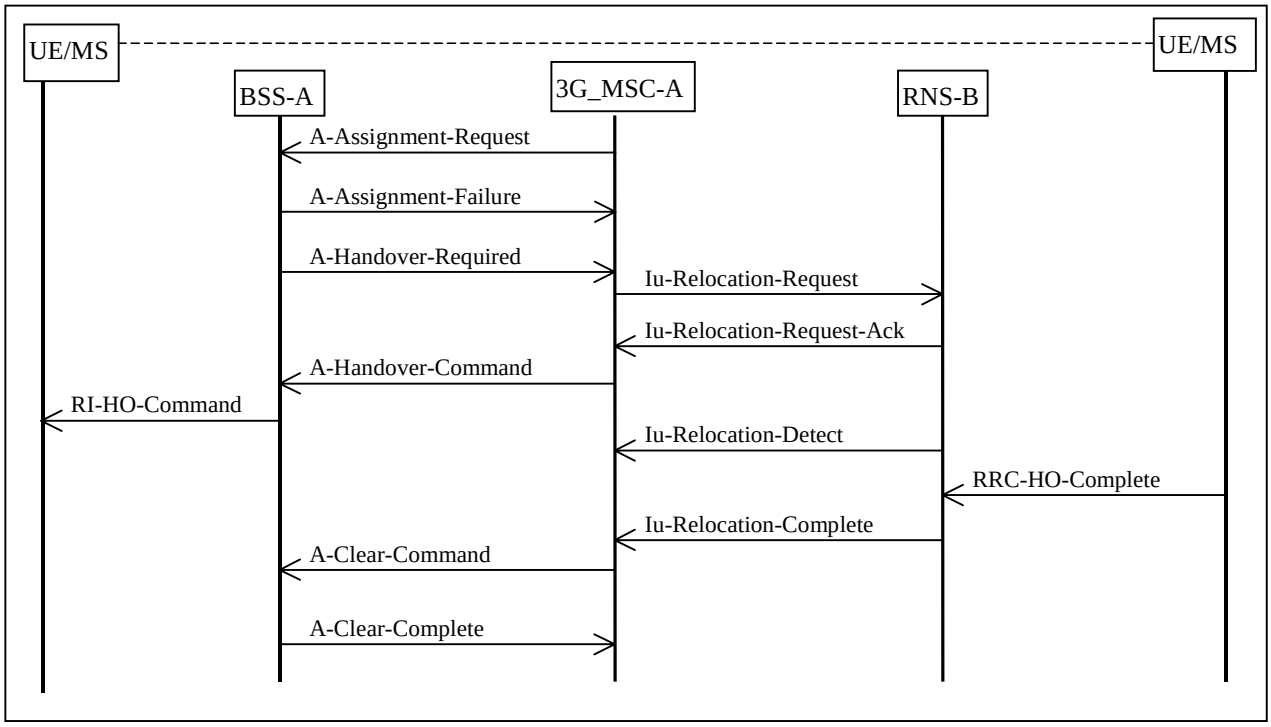

Figure 40a: Example of a Directed Retry Intra-3G_MSC GSM to UMTS Handover Procedure

If a failure occurs during the handover attempt, for example A-HANDOVER-FAILURE returned from BSS-A or Iu-RELOCATION FAILURE from RNS-B then 3G_MSC-A will terminate the GSM to UMTS handover to RNS-B. Under these conditions 3G_MSC-A may optionally take one of a number of actions:

i) send an A-HANDOVER-REQUIRED-REJECT to BSS-A, if an A-HANDOVER-COMMAND has not already been sent;

ii) retry the assignment procedure to BSS-A, if the failure message was returned from BSS-A. This option is additional to those for normal handover;

iii) Clear the complete call.

The procedures for Inter-3G_MSC GSM to UMTS handover are also applicable to the directed retry process. If an Inter-3G_MSC GSM to UMTS handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the A-HO-COMPLETE included in the MAP-SEND-END-SIGNAL request.

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CHANGE REQUEST

⌘ **23.009** **CR** **014** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

Title:	⌘	GSM to UMTS Handover: MAP parameter Target Cell ID
Source:	⌘	Ericsson
Work item code:	⌘	GSM UMTS interworking
Date:	⌘	2000-11-02
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	Target Cell Id in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER is not applicable in case of inter-system handover GSM to UMTS. Target RNC Id is included in the BSSAP message Handover Request and there is no need to send it also as a MAP parameter. It is proposed that neither the Target Cell Id nor the Target RNC Id shall be included in MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER in case of inter-system handover GSM to UMTS.
Summary of change:	⌘	Text mentioning Target Cell Id in sections decsribing MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER for GSM to UMTS HO is removed.
Consequences if not approved:	⌘	We would keep sending some data that has no sense.

Clauses affected:	⌘	8.2.1, 8.2.3.1,8.2.3.2		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.010 CR010, 29.002 CR195, 29.002 CR196
Other comments:	⌘			

First Change

8.2.1 Basic Handover procedure requiring a circuit connection between MSC-A and 3G_MSC-B

The procedure used for successful Inter-3G_MSC Handover from GSM to UMTS is shown in figure 24. Initiation of the GSM to UMTS handover procedure is described in clause 5. The procedure described in this subclause makes use of messages from the Technical Specification GSM 08.08 [5], TS 25.413 [11] and of the transport mechanism from the Mobile Application Part (MAP) (TS 29.002 [12]). After an Inter-3G_MSC handover further Intra-3G_MSC handovers may occur on 3G_MSC-B, these handovers will follow the procedures specified in the previous subclauses.

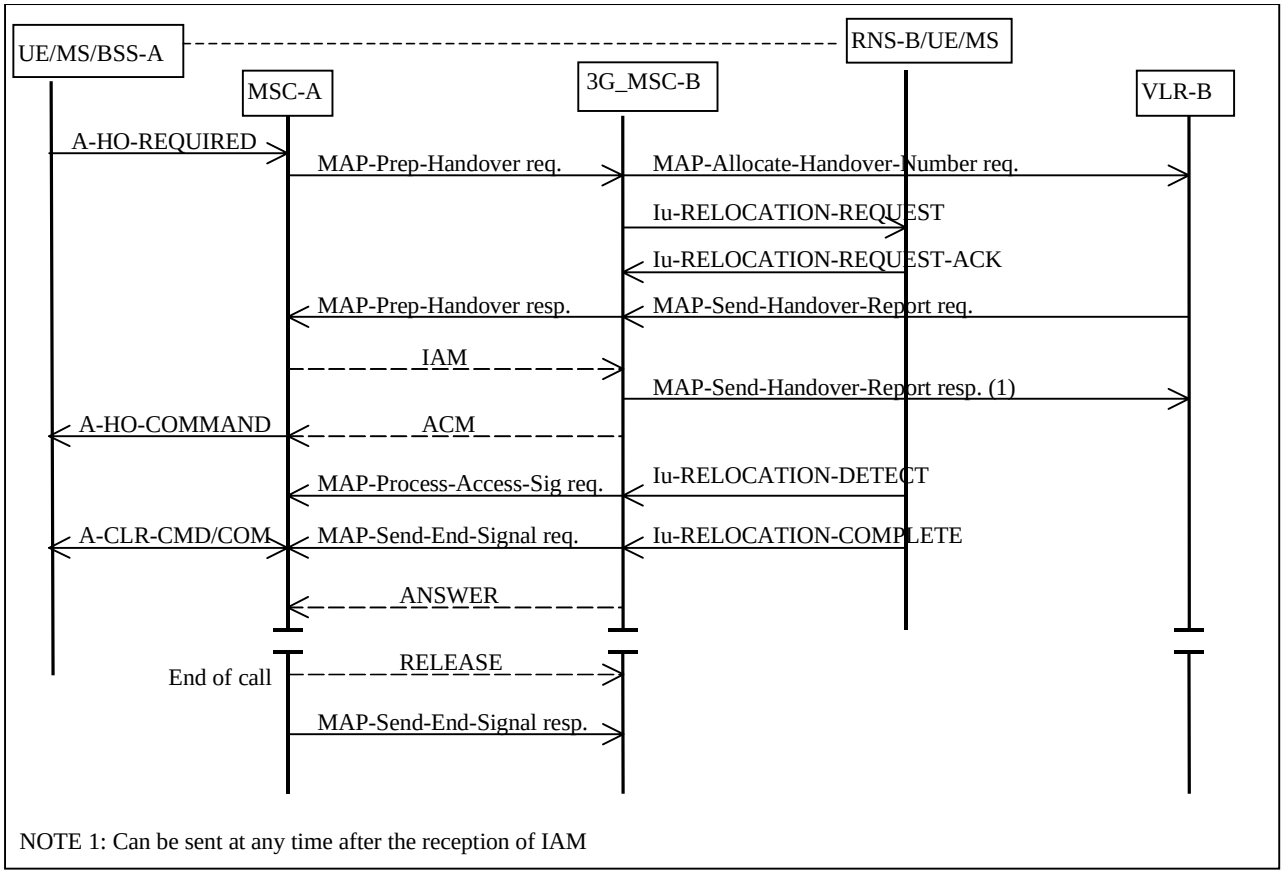

Figure 24: Basic GSM to UMTS Handover Procedure requiring a circuit connection

The GSM to UMTS handover is initiated as described in subclause 6.2.2. (This is represented by A-HO-REQUIRED in figure 24). Upon receipt of the A-HO-REQUIRED from BSS-A, MSC-A shall send a MAP-PREPARE-HANDOVER request to 3G_MSC-B including a complete A-HO-REQUEST message.

NOTE: MSC-A shall not send further MAP-PREPARE-HANDOVER requests while a MAP-PREPARE-HANDOVER response is pending or before any timeouts.

The MAP-PREPARE-HANDOVER request shall carry in the A-HO-REQUEST all information needed by 3G_MSC-B for allocating radio resources in RNS-B, see Technical Specification GSM 08.08 [5].

~~For compatibility reasons, the MAP-PREPARE-HANDOVER request will also identify the cell to which the call is to be handed over.~~ 3G_MSC-B will return the MAP-PREPARE-HANDOVER response after having retrieved a Handover Number from its associated VLR (exchange of the messages MAP-allocate-handover-number request and MAP-send-handover-report request). The Handover Number shall be used for routing the connection of the call from MSC-A to 3G_MSC-B. 3G_MSC-B inserts a transcoder as G711 is assumed

between 2G MSC and 3G_MSC-B. If radio resources are available in RNS-B the MAP-PREPARE-HANDOVER response, sent to MSC-A from 3G_MSC-B will contain the complete A-HO-REQUEST-ACK message generated from the Iu-RELOCATION-REQUEST-ACK received from RNS-B, containing the radio resources definition to be sent by BSS-A to the UE/MS. If the radio resource allocation is not possible, the MAP-PREPARE-HANDOVER response containing an A-HO-FAILURE will be sent to MSC-A. 3G_MSC-B will do the same if a fault is detected on the identity of the cell where the call has to be handed over. 3G_MSC-B simply reports the events related to the dialogue. It is up to MSC-A to decide the action to perform if it receives negative responses or the operation fails due to the expiry of the MAP-PREPARE-HANDOVER timer.

Next Change

8.2.3.1 Description of subsequent GSM to UMTS handover procedure i): MSC-B to 3G_MSC-A

The procedure for successful GSM to UMTS handover from MSC-B back to 3G_MSC-A is shown in figure 26.

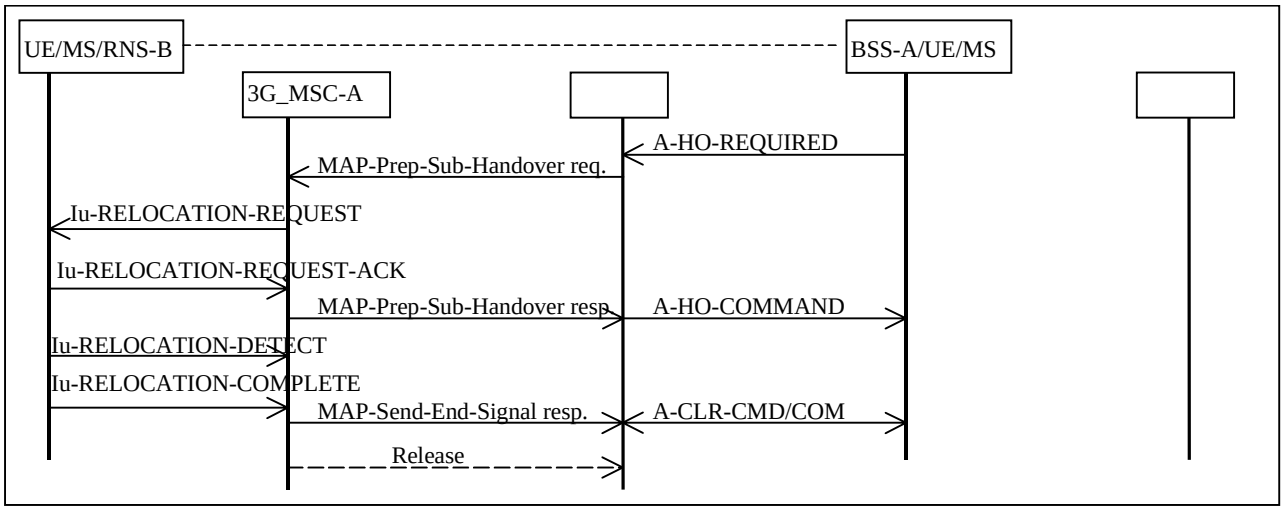

Figure 26: Subsequent GSM to UMTS handover procedure i): successful handover from MSC-B to 3G_MSC-A using a circuit connection

The procedure is as follows.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to 3G_MSC-A indicating the new MSC number (3G_MSC-A number)~~, indicating also the identity of the cell where the call has to be handed over~~ and including a complete A-HO-REQUEST message. (NOTE: MSC-B shall not send further MAP-PREPARE-SUBSEQUENT-HANDOVER requests while a handover attempt is pending or before any timeouts). Since 3G_MSC-A is the call controlling MSC, this MSC needs no Handover Number for routing purposes; 3G_MSC-A can immediately initiate the search for free radio resources. 3G_MSC-A then inserts a transcoder between it's RNS and the connection to the other party.

Next Change

8.2.3.2 Description of subsequent GSM to UMTS handover procedure ii): MSC-B to 3G_MSC-B''

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 27.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.3.1 (MSC-A can also be a 3G_MSC, the procedure is the same in both cases); and

- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in subclause 8.2.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of 3G_MSC-B'), ~~indicating also the target cell identity~~ and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards 3G_MSC-B'.

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CHANGE REQUEST

⌘ **23.122 CR 012** ⌘ rev **-** ⌘ Current version: **3.4.2** ⌘

*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:	⌘	Restoration of figure A.1
Source:	⌘	ERICSSON
Work item code:	⌘	GSM/UMTS interworking
Date:	⌘	10/11/2000
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	Figure A.1 has been replaced by mistake by another figure (copy/paste from figure 1). Last version of the 23.122 in which figure A.1 was correct is V3.1.1
Summary of change:	⌘	This CR replaces the wrong figure A.1 with a copy from figure A.1 as it was in 23.122 V3.1.1
Consequences if not approved:	⌘	Figure A.1 is not correct

Clauses affected:	⌘	Annex A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
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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.

HPLMN Matching Criteria in mobiles which don't support PCS1900 for NA:

Figure A.1 illustrates the logic flow described below. The text below is normative. Figure A.1 is informative.

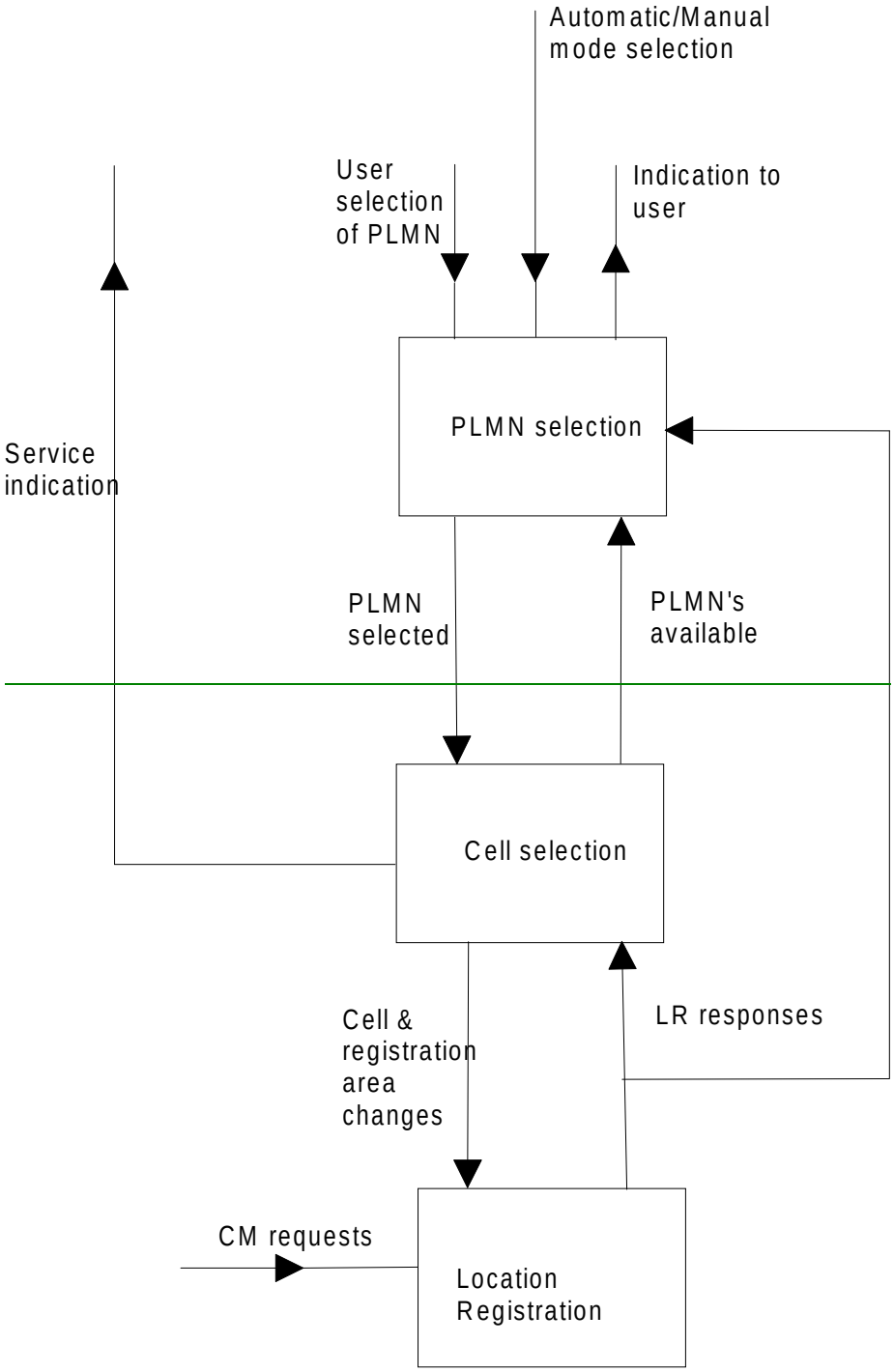
(1) The MS shall compare using all 3 digits of the SIM-MCC with the BCCH-MCC. If the values do not match, then the HPLMN match fails.

NOTE: If the MCC codes match, then the number of digits used for the SIM-MNC must be the same as the number of digits used for the BCCH-MNC.

(2) The MS shall read the 3rd digit of the BCCH-MNC. If the 3rd digit is Hex F, then proceed to step (4).

(3) The MS shall compare using all 3 digits of the SIM-MNC with the BCCH-MNC. If the values match, then the HPLMN match succeeds, otherwise the HPLMN match fails.

(4) The MS shall compare using just the 1st 2 digits the SIM-MNC with the BCCH-MNC. If the values match, then the HPLMN match succeeds, otherwise the HPLMN match fails.


Automatic/Manual
mode selection
User
selection
of PLMN
Indication to
user
PLMN selection
Service
indication
PLMN
selected
PLMN's
available
Cell selection
Cell &
registration
area
changes
LR responses
CM requests
Location
Registration

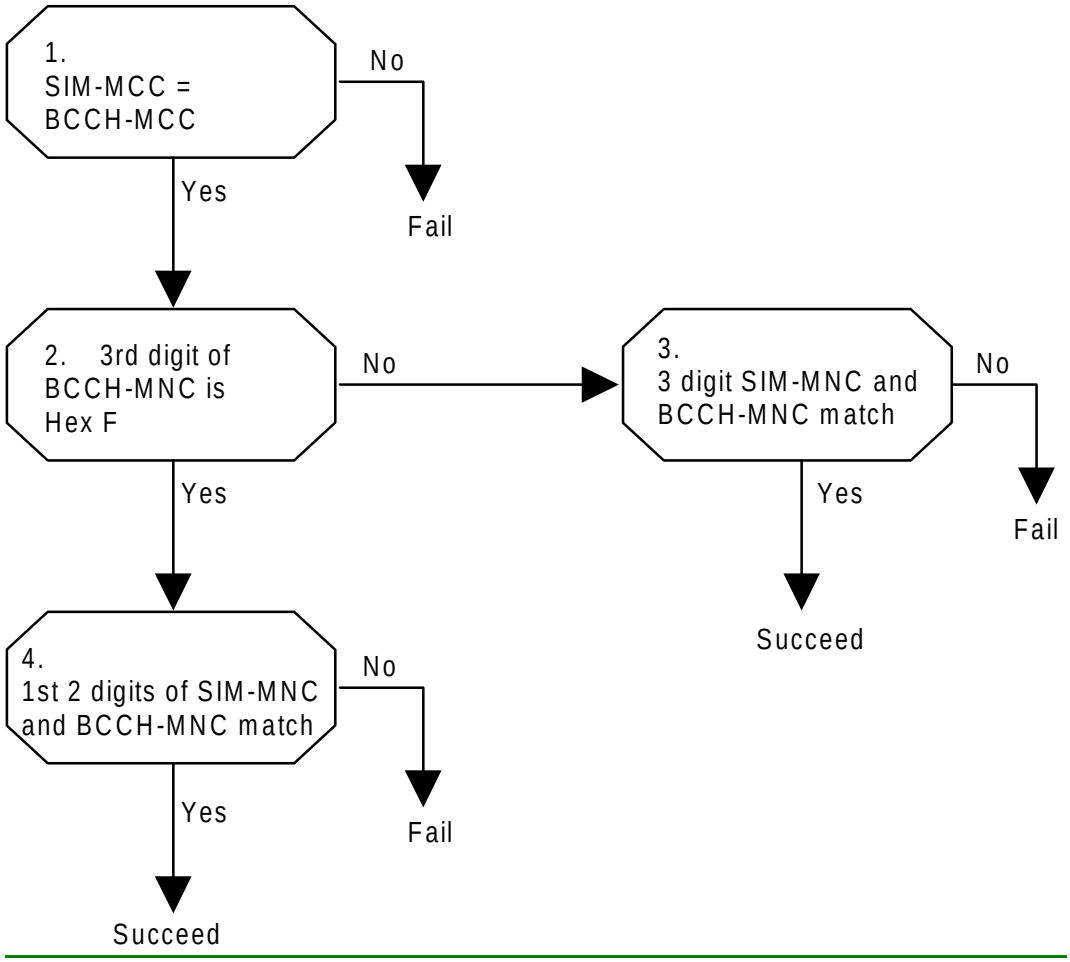


Figure A.1: HPLMN Matching Criteria Logic Flow for mobiles which support GSM and DCS1800 (informative)

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Tdoc N1-001237

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CHANGE REQUEST

⌘ **23.122 CR 013** ⌘ rev **-** ⌘ Current version: **3.4.2** ⌘

*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:	⌘	Alignment of figure 2a with PLMN selection for UMTS
Source:	⌘	ERICSSON
Work item code:	⌘	GSM/UMTS interworking
Date:	⌘	10/11/2000
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	The text in figure 2a has not been changed when introducing the PLMN selection for UMTS
Summary of change:	⌘	-
Consequences if not approved:	⌘	Inconsistency within the 23.122

Clauses affected:	⌘	5		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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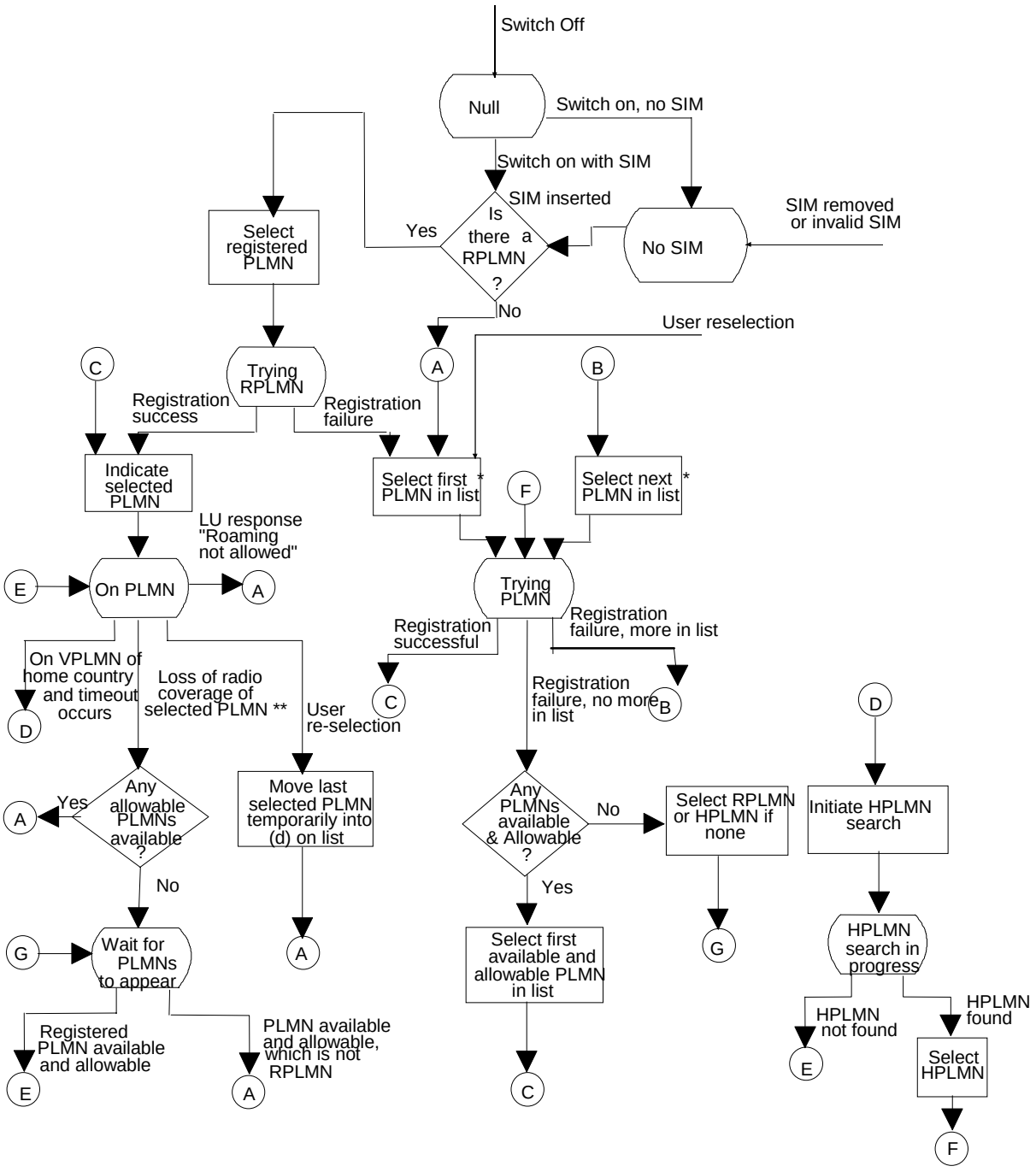
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.



* "List" consists of ~~(in order)~~ points i) to v) as defined in section 4.4.3.1.1 except in case of a user re-selection in which case "list" consists of points i) to vi) as defined in section 4.4.3.2.1

~~a) HPLMN~~
~~b) Each PLMN in SIM list in priority order~~
~~c) All other PLMNs above -85 dBm in random order~~
~~d) Other PLMNs in decreasing order of signal strength~~

~~Provided they are "available" and "allowable"~~

** Includes effective loss of coverage due to LAs being forbidden in all potentially suitable cells

Figure 2a: PLMN Selection State diagram (automatic mode)

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Tdoc N1-001246

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CHANGE REQUEST

⌘ **24.007** **CR** **027** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Title:	⌘	Updating CS/PS protocol architecture figure with RABM
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	01/11/00
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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: ⌘

To align figure 5.6, describing the CS/PS protocol architecture, with figure 5.5 in 24.007, describing the PS protocol architecture, this CR proposes to update figure 5.6 with the new entity RABM which was introduced in N1 #13.

In addition this CR proposes to add some description text regarding the RABM entity.

With the CR 25.331 573r1 the Flow Id is replaced by the CN domain Id. To align 24.007 with 25.332, this CR adds the CN Domain Identity to the primitives GMMAS-RELEASE-REQ and GMMAS- DATA-REQ in 24.007. And in addition, deletes the parameter Protocol Discriminator from primitive GMMAS-ESTABLISH-REQ in section 9.3.4.

In addition, a cause value has been added to GMMAS-RELEASE-IND in order for the RRC layer to forward the cause for the release of the signalling connection. GMM-PDU has been replaced with Layer3-PDU in primitives GMMAS- DATA-IND, GMMAS-DATA-REQ and GMMAS-ESTABLISH-REQ as SM and SMS messages are routed via GMM.

Summary of change: ⌘

Consequences if not approved: ⌘ Inconsistency between 25.331 and 24.007.

Clauses affected: ⌘ 5.2, 9.3.4

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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

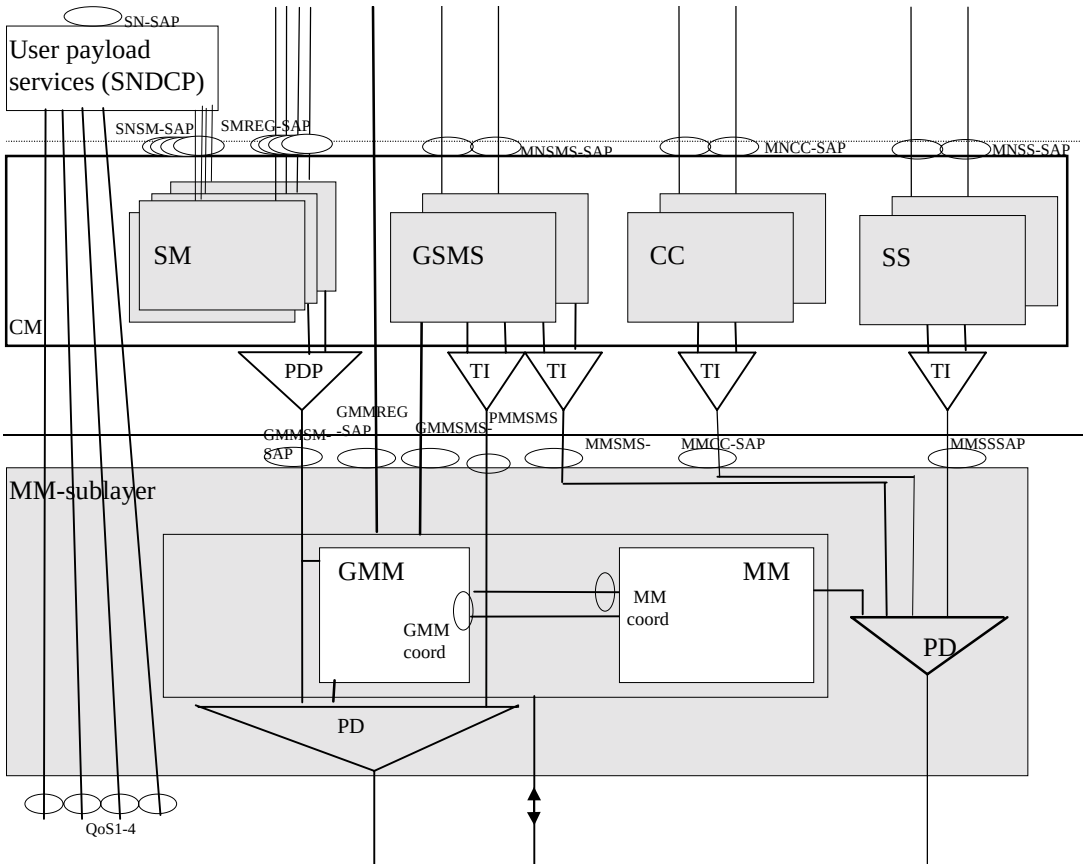
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

5.2 Protocol architecture

The protocol architecture is visualised for each of the three models:

- Figure 5.1/TS 24.007 shows the protocol architecture for a MS not supporting the GPRS service, restricting the representation of CM sublayer protocols to four paradigmatic examples, CC, LCS, SS, and SMS. Note that the protocol stack for a class C GPRS service may be present in the MS, but it is not active simultaneously.
- Figure 5.2 shows the protocol architecture for a MS supporting the Class C GPRS service. (Note that the protocol stack for a circuit switched services may be present in the MS, but it is not active simultaneously).
- Figure 5.3 shows the protocol architecture for non-GPRS and GPRS-services supporting Class A and Class B MSs.
- Figure 5.4 shows the protocol architecture for a MS supporting CTS services in addition to non-GPRS services.
- Figure 5.5 shows the protocol architecture for a MS supporting the PS mode of operation UMTS service.
- Figure 5.6 shows the protocol architecture for UMTS services supporting CS/PS mode of operation MSs.



~~Figure 5.6/24.007: Protocol architecture of Non Access Stratum supporting CS/PS mode of operation MSs, MS – side~~

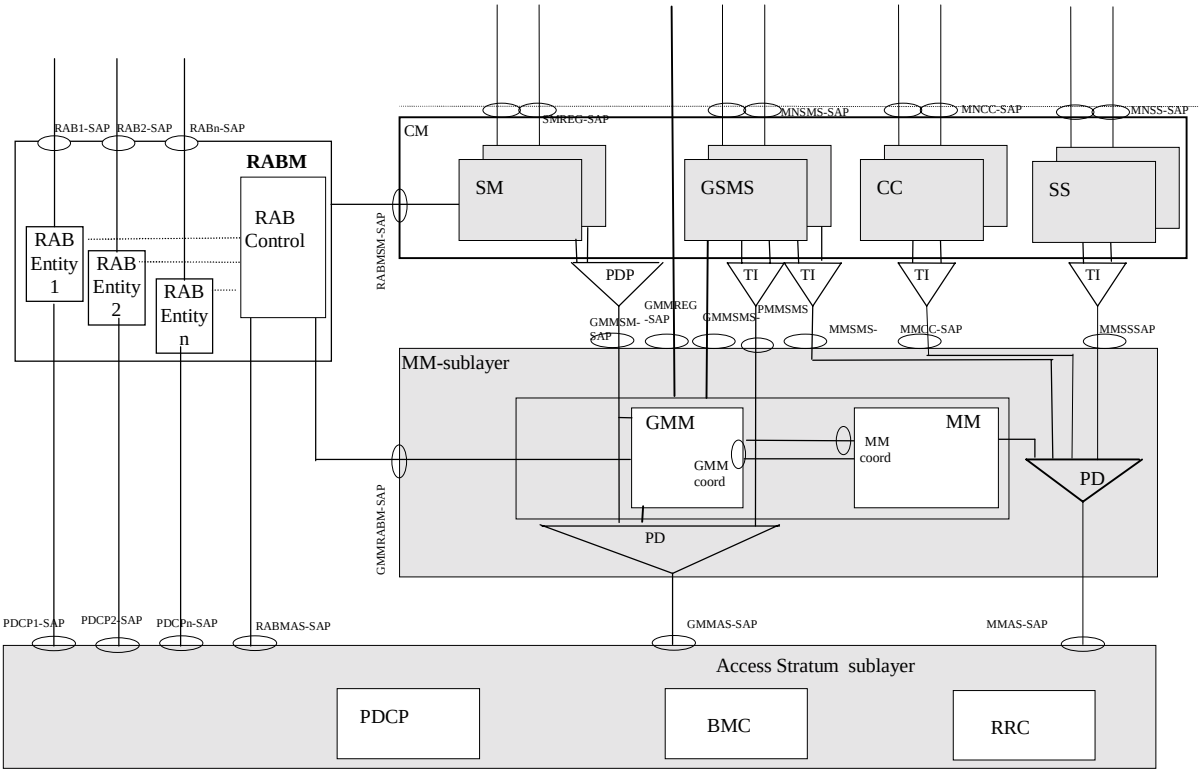


Figure 5.6/24.007: Protocol architecture of Non Access Stratum supporting CS/PS mode of operation MSs, MS – side

NOTE: SMS un-related parts of this figure, e.g. SNDCP should be modified for UMTS

As shown in figure 5.1 a hierarchy of 3 sublayers is defined:

- the RR sublayer provides services to the MM sublayer and utilizes the services of signalling layer 2;
- the MM sublayer provides common services to the entities of the Connection Management (CM) sublayer;
- the CM sublayer includes, among others, the CC, SS, and SMS entities, which are independent entities.

Figure 5.2 defines four sublayers for GPRS services supporting Class C MSs:

- the RR sublayer provides services to the MM and LLC sublayers;
- the LLC sublayer provides services to the MM sublayer, the SNDCP and GSMS entities and uses services of the RR sublayer;
- the MM sublayer provides services to the SM entities of the CM. The MM sublayer includes one GMM;
- the CM sublayer includes the SM and GSMS entities. The SM entity provides services to the SNDCP entity and uses services of the MM sublayer. The GSMS entity is identical to the SMS entity for non-GPRS services except it uses the services from the LLC sublayer.

Figure 5.3 defines four sublayers for non-GPRS and GPRS-services supporting Class A and Class B MSs:

- the RR sublayer provides services to the MM and LLC sublayers;
- the LLC sublayer provides services to the MM sublayer, the SNDCP and GSMS entities and uses services of the RR sublayer;

- the MM sublayer provides services to the SNDCP entity and to the entities of the Connection Management (CM) sublayer. In addition to the MM entity for non-GPRS services, the MM sublayer further includes one GMM entity;

- the CM sublayer includes, among others, the CC, SS, GSMS and SM entities, which are independent entities.

- The SM entity provides services to the SNDCP entity and uses services of the MM sublayer.
  The GSMS entity is an extension of the SMS entity for non-GPRS services. For message transfer it uses the services both from the LLC sublayer and the MM entity of the MM sublayer. Furthermore it retrieves from the MM entity information about which transport service to use.

Figure 5.4 defines three sub-layers for CTS services:

- the RR sublayer provides services (including CTS services) to the MM sublayer and uses the services of signalling layer 2;

- the MM sublayer provides common services to the entities of the Connection Management (CM) sublayer; it provides also specific CTS services to the entities above CM;

- the CM sublayer includes, among others, the CC, SS, and SMS entities, which are independent entities.

Figure 5.5 defines three sublayers for UMTS PS domain services supporting PS mode of operation:

- the Access Stratum (AS) sublayer provides services to the MM sublayer and the RAB Manager (RABM) entity.

- the MM sublayer provides services to the SM entities and GSMS entities of the CM. The MM sublayer includes one GMM entity;

- the CM sublayer includes the SM and GSMS entities. The SM entity provides services to the RABM entity and uses services of the MM sublayer. The GSMS entity is identical to the SMS entity for GPRS services in GSM except it uses the services from the GMM sublayer.

  The RABM hides the concepts of RABs that can be activated /released while a PDP context is active. If UL data in the terminal is to be sent on a RAB (NSAPI) that has been released the RABM will trigger a service request procedure in GMM. ~~The RABM entity replaces the "User payload services (SNDCP)" entity used in GSM.~~

Figure 5.6 defines ~~two~~ three sublayers for UMTS CS domain services and UMTS PS domain services supporting CS/PS mode of operation MSs:

- the Access Stratum (AS) sublayer provides services to the MM sublayer and the RAB Manager (RABM) entity.

- the MM sublayer provides services to the entities of the Connection Management (CM) sublayer. In addition to the MM entity for CS domain services, the MM sublayer further includes one GMM entity;

- the CM sublayer includes, among others, the CC, SS, GSMS and SM entities, which are independent entities;

  The SM entity provides services to the ~~PDCP~~ RABM entity and uses services of the MM sublayer. The GSMS entity is an extension of the SMS entity for CS domain services. For message transfer it uses the services both from the GMM entity of the MM sublayer and the MM entity of the MM sublayer. Furthermore it retrieves from the MM entity information about which transport service to use.

  The RABM hides the concepts of RABs that can be activated /released while a PDP context is active. If UL data in the terminal is to be sent on a RAB (NSAPI) that has been released, the RABM will trigger a service request procedure in GMM.

*** Next Modification ***

9.3.4 Service primitives for GMMAS-SAP (UMTS only)

Table 9.3.4: Service primitives and parameters at GMMAS-SAP - MS side

PRIMITIVE	PARAMETER (message, info elements of message, other parameters)	REFERENCE
GMMAS-SECURITY-IND		9.3.4.1
GMMAS-SECURITY-RES	CK, IK	9.3.4.2
GMMAS- ESTABLISH-REQ	~~GMM~~Layer 3-PDU, Establishment cause, Priority, ~~Protocol Discriminator,~~ CN Domain Identity, MS Identity, LAI/RAI	9.3.4.3
GMMAS- ESTABLISH-CNF		9.3.4.4
GMMAS- ESTABLISH-REJ		9.3.4.5
GMMAS- RELEASE-REQ	CN Domain identity	9.3.4.6
GMMAS- RELEASE-IND	Cause	9.3.4.7
GMMAS- DATA-REQ	~~GMM~~Layer 3-PDU, Priority, CN Domain identity	9.3.4.8
GMMAS- DATA-IND	~~GMM~~Layer 3-PDU	9.3.4.9
GMMAS-PAGE-IND	MS Identity type, Paging Cause	9.3.4.10
GMMAS-STATUS-IND	Cause	9.3.4.11

9.3.4.1 GMMAS-SECURITY-IND

Indication from the AS sublayer that ciphering (and integrity protection) shall be started. The GMM sublayer uses this primitive as an indication of the completion of the service request procedure.

9.3.4.2 GMMAS-SECURITY-RES

Ciphering and integrity keys are assigned to the AS sublayer to enable ciphering (and integrity protection).

9.3.4.3 GMMAS-ESTABLISH-REQ

To establish a signalling connection and to carry the initial ~~GMM~~Layer 3-PDU over the radio interface.

9.3.4.4 GMMAS-ESTABLISH-CNF

Confirmation from the AS sublayer that a PS signalling connection has been established.

9.3.4.5 GMMAS-ESTABLISH-REJ

The attempt to establish a PS signalling connection was rejected by the network.

9.3.4.6 GMMAS- RELEASE-REQ

Request used by the MM-sublayer to request the release of the PS signalling connection.

9.3.4.7 GMMAS- RELEASE-IND

Indication from the AS sublayer that the PS signalling connection has been released.

9.3.4.8 GMMAS- DATA-REQ

Request used by the MM-sublayer for transfer of data.

9.3.4.9 GMMAS- DATA-IND

Indication used by the AS sublayer to transfer received data to MM sublayer.

9.3.4.10 GMMAS-PAGE-IND

A paging message has been received by the AS sublayer.

9.3.4.11 GMMAS-STATUS-IND

Indication used by the AS sublayer to transfer failures to the MM sublayer.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales, 20-24 November 2000

Tdoc N1-001247

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **282** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

Title:	⌘	Description of Timer T3317 on expiry
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS interworking
Date:	⌘	2000-11-13
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	To correct the description of timer T3317 on expiry in Ch. 4.7.13.5 and align with Table 11.3a.
Summary of change:	⌘	
Consequences if not approved:	⌘	

Clauses affected:	⌘	Ch. 4.7.13.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4.7.13.5 Abnormal cases in the MS

The following abnormal cases can be identified:

a) Access barred because of access class control

The Service request procedure shall not be started. The MS stays in the current serving cell and applies normal cell reselection process. The Service request procedure may be started by CM layer if it is still necessary, i.e. when access is granted or because of a cell change.

b) Lower layer failure before the security mode control procedure is completed, SERVICE ACCEPT or SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

The MS shall enter GMM-REGISTERED state.

If the MS is in PMM-IDLE mode then the procedure shall be aborted and the MS shall initiate a PS signalling connection release.

If the MS is in PMM-CONNECTED mode, then the procedure shall be aborted.~~an expiry of the timer T3317 shall be treated as a completion of the service request procedure.~~

d) SERVICE REJECT received other causes than those treated in section 4.7.x.4

The procedure shall be aborted.

e) Routing area update procedure is triggered

If a cell change into a new routing area occurs and the necessity of routing area update procedure is determined before the security mode control procedure is completed, a SERVICE ACCEPT or SERVICE REJECT message has been received, the Service request procedure shall be aborted and the routing area updating procedure is started immediately. Follow-on request pending may be indicated in the ROUTING AREA UPDATE REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart the pending service itself or the Service Request procedure after the completion of the routing area updating procedure. If the service type of the aborted SERVICE REQUEST was indicating "data", then the routing area update procedure may be followed by a re-initiated Service request procedure indicating "data", if it is still necessary.

f) Power off

If the MS is in state GMM-SERVICE-REQUEST-INITIATED at power off, the GPRS detach procedure shall be performed.

g) Procedure collision

If the MS receives a DETACH REQUEST message from the network in state GMM-SERVICE-REQUEST-INITIATED, the GPRS detach procedure shall be progressed and the Service request procedure shall be aborted. If the cause IE, in the DETACH REQUEST message, indicated a "reattach request", the GPRS attach procedure shall be performed.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales, 20-24 November 2000

Tdoc N1-001248

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **283** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Description of Timer T3317 on expiry
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2000-11-13
Category:	⌘	**A**
Release:	⌘	REL-4

Use one 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 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:	⌘	To correct the description of timer T3317 on expiry in Ch. 4.7.13.5 and align with Table 11.3a.
Summary of change:	⌘	
Consequences if not approved:	⌘	

Clauses affected:	⌘	Ch. 4.7.13.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4.7.13.5 Abnormal cases in the MS

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b) Lower layer failure before the security mode control procedure is completed, SERVICE ACCEPT or SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

The MS shall enter GMM-REGISTERED state.

If the MS is in PMM-IDLE mode then the procedure shall be aborted and the MS shall initiate a PS signalling connection release.

If the MS is in PMM-CONNECTED mode, then the procedure shall be aborted.~~an expiry of the timer T3317 shall be treated as a completion of the service request procedure.~~

d) SERVICE REJECT received other causes than those treated in section 4.7.x.4

The procedure shall be aborted.

e) Routing area update procedure is triggered

If a cell change into a new routing area occurs and the necessity of routing area update procedure is determined before the security mode control procedure is completed, a SERVICE ACCEPT or SERVICE REJECT message has been received, the Service request procedure shall be aborted and the routing area updating procedure is started immediately. Follow-on request pending may be indicated in the ROUTING AREA UPDATE REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart the pending service itself or the Service Request procedure after the completion of the routing area updating procedure. If the service type of the aborted SERVICE REQUEST was indicating "data", then the routing area update procedure may be followed by a re-initiated Service request procedure indicating "data", if it is still necessary.

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If the MS is in state GMM-SERVICE-REQUEST-INITIATED at power off, the GPRS detach procedure shall be performed.

g) Procedure collision

If the MS receives a DETACH REQUEST message from the network in state GMM-SERVICE-REQUEST-INITIATED, the GPRS detach procedure shall be progressed and the Service request procedure shall be aborted. If the cause IE, in the DETACH REQUEST message, indicated a "reattach request", the GPRS attach procedure shall be performed.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001250

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **284** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

Title:	⌘	RR connection replaced with PS signalling connection
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2000-11-14
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	With the LS in Tdoc N1-001146 (R2-001961), RAN2 are asking N1 to consider to align the terminology with RAN2, by considering introducing the terms “CS signalling connection” and “PS signalling connection”, since RAN2 does not use the term “RR connection”, and since the name itself is very close to “RRC connection” which means something different.
Summary of change:	⌘	RR connection has been replaced with PS signalling connection
Consequences if not approved:	⌘	

Clauses affected:	⌘	4.1, 4.7.3, 4.7.5
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ 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.

4 Elementary procedures for Mobility Management

4.1 General

This section describes the procedures used for mobility management for non-GPRS services and for GPRS-services at the radio interface (Reference Point Um and Uu).

The main function of the Mobility Management sublayer is to support the mobility of user terminals, such as informing the network of its present location and providing user identity confidentiality.

A further function of the MM sublayer is to provide connection management services to the different entities of the upper Connection Management (CM) sublayer (see TS 24.007).

There are two sets of procedures defined in this chapter:

- MM procedures for non-GPRS services (performed by the MM entity of the MM sublayer); and
- GMM procedures for GPRS services (performed by the GMM entity of the MM sublayer), see TS 24.007 [20].

All the MM procedures described in this section can only be performed if a RR connection has been established between the MS and the network. Else, the MM sublayer has to initiate the establishment of a RR connection (see GSM 04.18 section 3.3 and TS 25.331 section 8.2.3).

In A/Gb mode, ~~T~~the GMM procedures described in this section, use services provided by the RR sublayer without prior RR connection establishment.

In Iu mode: all the GMM procedures described in this section can only be performed if a PS signalling connection has been established between the MS and the network. Else, the GMM sublayer has to initiate the establishment of a PS signalling connection (see TS 25.331).

GMM procedures are mandatory and applicable only for GPRS MSs and networks supporting those MSs. For GPRS MSs which are IMSI attached for both GPRS and non-GPRS services, some MM procedures are replaced by GMM combined procedures provided that the network operates in network operation mode I, i.e. is supporting combined GMM procedures. GMM combined procedures are not applicable for the GPRS MS operation mode C but are mandatory for the GPRS MS operation modes A and B and networks supporting network operation mode I, see TS 23.060.

***** Next Modification *****

4.1.1 MM and GMM procedures

4.1.1.1 Types of MM and GMM procedures

Depending on how they can be initiated, three types of MM procedures can be distinguished:

1) MM common procedures:

   A MM common procedure can always be initiated whilst a RR connection exists. The procedures belonging to this type are:

   Initiated by the network:

   - TMSI reallocation procedure;
   - authentication procedure;
   - identification procedure;
   - MM information procedure;
   - abort procedure.

However, abort procedure is used only if an MM connection is being established or has already been established i.e. not during MM specific procedures or during IMSI detach procedure, see section 4.3.5.

Initiated by the mobile station:

- IMSI detach procedure (with the exceptions specified in section 4.3.4).

ii) MM specific procedures:

A MM specific procedure can only be initiated if no other MM specific procedure is running or no MM connection exists. The procedures belonging to this type are:

- normal location updating procedure;
- periodic updating procedure;
- IMSI attach procedure.

iii) MM connection management procedures:

These procedures are used to establish, maintain and release a MM connection between the mobile station and the network, over which an entity of the upper CM layer can exchange information with its peer. A MM connection establishment can only be performed if no MM specific procedure is running. More than one MM connection may be active at the same time.

Depending on how they can be initiated, two types of GMM procedures can be distinguished:

i) GMM common procedures:

In Iu mode, a GMM common procedure can always be initiated whilst a PS signalling connection exists.

The procedures belonging to this type are:

Initiated by the network when a GMM context has been established:

- P-TMSI (re-) allocation;
- GPRS authentication and ciphering;
- GPRS identification;
- GPRS information.

ii) GMM specific procedures:

Initiated by the network and used to detach the IMSI in the network for GPRS services and/or non-GPRS services and to release a GMM context:

- GPRS detach.

Initiated by the MS and used to attach or detach the IMSI in the network for GPRS services and/or non-GPRS services and to establish or release a GMM context:

- GPRS attach and combined GPRS attach;
- GPRS detach and combined GPRS detach.

Initiated by the MS when a GMM context has been established:

- normal routing area updating and combined routing area updating;
- periodic routing area updating.

In UMTS, initiated by the MS and used to establish a secure connection to the network and/or to request the resource reservation for sending data:

- Service Request

***** Next Modification *****

4.7.3 GPRS attach procedure

The GPRS attach procedure is used for two purposes:

- normal GPRS attach, performed by the MS to IMSI attach for GPRS services only. The normal GPRS attach procedure shall be used by GPRS MSs in MS operation mode C, independent of the network operation mode. It shall also be used by GPRS MSs in MS operation modes A or B if the network operates in network operation mode II or III .

- combined GPRS attach procedure, used by GPRS MSs in MS operation modes A or B to attach the IMSI for GPRS and non-GPRS services provided that the network operates in network operation mode I.

With a successful GPRS attach procedure a GMM context is established.

Section 4.7.3.1 describes the GPRS attach procedure to attach the IMSI only for GPRS services. The combined GPRS attach procedure used to attach the IMSI for both GPRS and non-GPRS services is described in section 4.7.3.2.

If an IMSI attach for non-GPRS services is requested and a GMM context exists, the routing area updating procedure shall be used as described in section 4.7.5.2.

To limit the number of subsequently rejected attach attempts, a GPRS attach attempt counter is introduced. The GPRS attach attempt counter shall be incremented as specified in section 4.7.3.1.5. Depending on the value of the GPRS attempt counter, specific actions shall be performed. The GPRS attach attempt counter shall be reset when:

- the MS is powered on;

- a SIM is inserted;

- a GPRS attach procedure is successfully completed; or

- a combined GPRS attach procedure is completed for GPRS services only with cause #2, #16, #17 or #22

- a GPRS attach procedure is completed with cause #11, #12 or #13,

and additionally when the MS is in substate ATTEMPTING-TO-ATTACH:

- expiry of timer T3302;

- a new routing area is entered; or

- an attach is triggered by CM sublayer requests.

The mobile equipment shall contain a list of "forbidden location areas for roaming", as well as a list of "forbidden location areas for regional provision of service". The handling of these lists is described in section 4.4.1; the same lists are used by GMM and MM procedures.

4.7.3.1 GPRS attach procedure for GPRS services

The GPRS attach procedure is a GMM procedure used by GPRS MSs to IMSI attach for GPRS services.

The attach type information element shall indicate "GPRS attach".

4.7.3.1.1 GPRS attach procedure initiation

In state GMM-DEREGISTERED, the MS initiates the GPRS attach procedure by sending an ATTACH REQUEST message to the network, starts timer T3310 and enters state GMM-REGISTERED-INITIATED.

The MS capable both UMTS and GSM or only GSM system shall include a valid P-TMSI, if any is available, the P-TMSI signature associated with the P-TMSI and the routing area identity associated with the P-TMSI in the ATTACH REQUEST message. If there is no valid P-TMSI available, the IMSI shall be included instead of the P-TMSI and P-TMSI signature.

The MS shall also indicate within the DRX parameters whether it supports the split pg cycle option on CCCH. The optional support of the split pg cycle on CCCH by the network is indicated in SI13 or PSI1. Split pg cycle on CCCH is applied by both the network and the MS when the split pg cycle option is supported by both (see GSM 05.02).

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the GPRS attach procedure, it may set a follow-on request pending indicator on.

4.7.3.1.2 GMM common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM identification and GMM authentication and ciphering procedure, depending on the received information such as IMSI, CKSN, old RAI, P-TMSI and P-TMSI signature.

4.7.3.1.3 GPRS attach accepted by the network

If the GPRS attach request is accepted by the network, an ATTACH ACCEPT message is sent to the MS.

The P-TMSI reallocation may be part of the GPRS attach procedure. The P-TMSI that shall be allocated is then included in the ATTACH ACCEPT message together with the routing area identifier. The network shall, in this case, change to state GMM-COMMON-PROCEDURE-INITIATED and shall start timer T3350 as described in section 4.7.6. Furthermore, the network may assign a P-TMSI signature for the GMM context which is then also included in the ATTACH ACCEPT message. If the LAI or PLMN identity that has been transmitted in the ATTACH ACCEPT message is a member of any of the "forbidden" lists, any such entry shall be deleted. Additionally, the network shall include the radio priority level to be used by the MS for mobile originated SMS transfer in the ATTACH ACCEPT message.

In GSM, the Cell Notification information element shall be included in the ATTACH ACCEPT message by the network which indicates that the Cell Notification is supported by the network.

In UMTS, the network should prolong the ~~RR~~ PS signalling connection if the mobile station has indicated a follow-on request pending in ATTACH REQUEST. The network may also prolong the ~~RR~~ PS signalling connection without any indication from the mobile terminal.

The MS, receiving an ATTACH ACCEPT message, stores the received routing area identification, stops timer T3310, reset the GPRS attach attempt counter, reset the routing area updating attempt counter, enters state GMM-REGISTERED and sets the GPRS update status to GU1 UPDATED.

If the message contains a P-TMSI, the MS shall use this P-TMSI as the new temporary identity for GPRS services. In this case, an ATTACH COMPLETE message is returned to the network. The MS shall delete its old P-TMSI and shall store the new one. If no P-TMSI has been included by the network in the ATTACH ACCEPT message, the old P-TMSI, if any available, shall be kept.

If the message contains a P-TMSI signature, the MS shall use this P-TMSI signature as the new temporary signature for the GMM context. The MS shall delete its old P-TMSI signature, if any is available, and shall store the new one. If the message contains no P-TMSI signature, the old P-TMSI signature, if available, shall be deleted.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

In GSM, if the ATTACH ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates. The network receiving an ATTACH COMPLETE message stops timer T3350, changes to GMM-REGISTERED state and considers the P-TMSI sent in the ATTACH ACCEPT message as valid.

***** Next Modification *****

4.7.3.2 Combined GPRS attach procedure for GPRS and non-GPRS services

The combined GPRS attach procedure is a GMM procedure used by a GPRS MS operating in MS operation modes A or B for IMSI attach for GPRS and non-GPRS services if the network operates in network operation mode I:.

If a GPRS MS operating in MS operation modes A or B is already attached for non-GPRS services by use of the MM specific IMSI attach procedure, but additionally wishes to perform an IMSI attach for GPRS services, the combined GPRS attach procedure shall also be used.

The attach type information element shall indicate "combined GPRS attach". In this case, the messages ATTACH ACCEPT, ATTACH COMPLETE, and ATTACH REJECT used by the combined GPRS attach procedure carry information for both the GPRS and the non-GPRS services.

4.7.3.2.1 Combined GPRS attach procedure initiation

If the MS is in GMM state GMM-DEREGISTERED and in MM state MM IDLE, the MS initiates the combined GPRS attach procedure by sending an ATTACH REQUEST message to the network, starts timer T3310 and enters state GMM-REGISTERED-INITIATED and MM LOCATION UPDATING PENDING.

The MS shall include a valid P-TMSI, if available, the P-TMSI signature associated with the P-TMSI and the routing area identity associated with the P-TMSI in the ATTACH REQUEST message. If there is no valid P-TMSI available, the IMSI shall be included instead of the P-TMSI and P-TMSI signature. Furthermore the MS shall include the TMSI status IE if no valid TMSI is available.

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the GPRS attach, it may set a follow-on request pending indicator on.

***** Next Modification *****

4.7.5 Routing area updating procedure

This procedure is used for:

- normal routing area updating to update the registration of the actual routing area of an MS in the network. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services if the network operates in network operation mode II or III;

- combined routing area updating to update the registration of the actual routing and location area of an MS in the network. This procedure is used by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services provided that the network operates in network operation mode I; or

- periodic routing area updating. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS or for GPRS and non-GPRS services independent of the network operation mode;

- IMSI attach for non-GPRS services when the MS is IMSI attached for GPRS services. This procedure is used by GPRS MSs in MS operation modes A or B, if the network operates in network operation mode I.

- in GSM, resuming GPRS services when the RR sublayer indicated a resumption failure after dedicated mode was left, see GSM 04.18.

- UMTS to GSM and for GSM to UMTS intersystem change, see section 4.7.1.7.

Section 4.7.5.1 describes the routing area updating procedures for updating the routing area only. The combined routing area updating procedure used to update both the routing and location area is described in section 4.7.5.2.

The routing area updating procedure is always initiated by the MS. It is only invoked in state GMM-REGISTERED.

To limit the number of subsequently rejected routing area update attempts, a routing area updating attempt counter is introduced. The routing area updating attempt counter shall be incremented as specified in section 4.7.5.1.5. Depending on the value of the routing area updating attempt counter, specific actions shall be performed. The routing area updating attempt counter shall be reset when:

- a GPRS attach procedure is successfully completed; or

- a routing area updating procedure is successfully completed;

and additionally when the MS is in substate ATTEMPTING-TO-UPDATE:

- a new routing area is entered;
- expiry of timer T3302; or
- at request from registration function.

The mobile equipment shall contain a list of "forbidden location areas for roaming", as well as a list of "forbidden location areas for regional provision of service". The handling of these lists is described in section 4.4.1.

In, GSM, user data transmission in the MS shall be suspended during the routing area updating procedure; user data reception shall be possible. User data transmission in the network shall be suspended during the routing area updating procedure, if a new P-TMSI is assigned.

In UMTS, user data transmission and reception in the MS shall not be suspended during the routing area updating procedure. User data transmission in the network shall not be suspended during the routing area updating procedure.

4.7.5.1 Normal and periodic routing area updating procedure

Periodic routing area updating is used to periodically notify the availability of the MS to the network. The value of the update type IE in the ROUTING AREA UPDATE REQUEST message shall indicate "periodic updating". The procedure is controlled in the MS by timer T3312. When timer T3312 expires, the periodic routing area updating procedure is started. Start and reset of timer T3312 is described in section 4.7.2.2.

In GSM, the normal routing area updating procedure is initiated when the MS detects a change of the routing area in state GMM-REGISTERED, or when the MS determines that GPRS resumption shall be performed. The ROUTING AREA UPDATE REQUEST message shall always be the first data sent by the MS when a routing area border is crossed. The routing area identification is broadcast on the broadcast channel(s).

In UMTS, the normal routing area updating procedure is initiated when the MS detects a change of the routing area in state GMM-REGISTERED. The ROUTING AREA UPDATE REQUEST message shall always be the first GMM message sent by the MS when a routing area border is crossed.

A normal routing area updating shall abort any ongoing GMM procedure. Aborted GMM procedures may be repeated after the normal routing area updating procedure has been successfully performed. The value of the update type IE included in the message shall indicate "normal routing area updating".

4.7.5.1.1 Normal and periodic routing area updating procedure initiation

To initiate the normal routing area updating procedure, the MS sends the message ROUTING AREA UPDATE REQUEST to the network, starts timer T3330 and changes to state GMM-ROUTING-AREA-UPDATING-INITIATED. The message ROUTING AREA UPDATE REQUEST shall contain the P-TMSI signature when received within a previous ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message.

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the normal routing area updating procedure, it may set a follow-on request pending indicator on.

4.7.5.1.2 GMM Common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM authentication and ciphering procedure.

4.7.5.1.3 Normal and periodic routing area updating procedure accepted by the network

If the routing area updating request has been accepted by the network, a ROUTING AREA UPDATE ACCEPT message shall be sent to the MS. The network may assign a new P-TMSI and/or a new P-TMSI signature for the MS. If a new P-TMSI and/or P-TMSI signature have been assigned to the MS, it/they shall be included in the ROUTING AREA UPDATE ACCEPT message together with the routing area identification.

In GSM the Cell Notification information element shall be included in the ROUTING AREA UPDATE ACCEPT message in order to indicate the ability of the network to support the Cell Notification.

The network shall change to state GMM-COMMON-PROCEDURE-INITIATED and shall start the supervision timer T3350 as described in section 4.7.6.

If the LAI or PLMN identity contained in the ROUTING AREA UPDATE ACCEPT message is a member of any of the "forbidden" lists then any such entry shall be deleted.

In UMTS, the network should prolong the ~~RR~~ PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the ~~RR~~ PS signalling connection without any indication from the mobile terminal.

Upon receipt of a ROUTING AREA UPDATE ACCEPT message, the MS stores the received routing area identification, stops timer T3330, shall reset the routing area updating attempt counter and sets the GPRS update status to GU1 UPDATED. If the message contains a P-TMSI, the MS shall use this P-TMSI as new temporary identity for GPRS services and shall store the new P-TMSI. If no P-TMSI was included by the network in the ROUTING AREA UPDATING ACCEPT message, the old P-TMSI shall be kept. Furthermore, the MS shall store the P-TMSI signature if received in the ROUTING AREA UPDATING ACCEPT message. If no P-TMSI signature was included in the message, the old P-TMSI signature, if available, shall be deleted.

In GSM, if the ROUTING AREA UPDATE ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contained:

- a P-TMSI; and/or
- Receive N-PDU Numbers (see 04.65 [78] and TS 25.322).

In this case the Receive N-PDU Numbers values valid in the MS, shall be included in the ROUTING AREA UPDATE COMPLETE message.

NOTE: In UMTS, after a routing area updating procedure, the mobile station can initiate Service Request procedure to request the resource reservation for the active PDP contexts if the resources have been released by the network or send upper layer message (e.g. ACTIVATE PDP CONTEXT REQUEST) to the network via the existing PS signaling connection.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

***** Next Modification *****

4.7.5.2 Combined routing area updating procedure

Within a combined routing area updating procedure the messages ROUTING AREA UPDATE ACCEPT and ROUTING AREA UPDATE COMPLETE carry information for the routing area updating and the location area updating.

4.7.5.2.1 Combined routing area updating procedure initiation

The combined routing area updating procedure is initiated only by a GPRS MS operating in MS operation modes A or B, if the MS is in state GMM-REGISTERED and if the network operates in network operation mode I:

- when a GPRS MS that is IMSI attached for GPRS and non-GPRS services detects a change of the routing area in state GMM-REGISTERED and MM-IDLE;
- when a GPRS MS that is IMSI attached for GPRS services wants to perform an IMSI attach for non-GPRS services;
- after termination of a non-GPRS service via non-GPRS channels to update the association if the MS has changed the LA during that non-GPRS service transaction; or.
- after a CM SERVICE REJECT message with cause value #4 is received by the mobile station (see section 4.5.1.1), in which case the update type IE shall be set to "Combined RA/LA updating with IMSI attach".

In GSM, the routing and location area identification are broadcast on the broadcast channel(s). A combined routing area updating procedure shall abort any ongoing GMM procedure. Aborted GMM procedures shall be repeated after the combined routing area updating procedure has been successfully performed. The ROUTING AREA UPDATE

REQUEST message shall always be the first message sent from the MS in the new routing area after routing area change.

In UMTS, the routing and location area identification are broadcast on the broadcast channel(s) or sent to the MS via the PS signaling connection. A combined routing area updating procedure shall abort any ongoing GMM procedure. Aborted GMM procedures may be repeated after the combined routing area updating procedure has been successfully performed. The ROUTING AREA UPDATE REQUEST message shall always be the first GMM message sent from the MS in the new routing area after routing area change.

To initiate a combined routing area updating procedure the MS sends the message ROUTING AREA UPDATE REQUEST to the network, starts timer T3330 and changes to state GMM-ROUTING-UPDATING-INITIATED and MM LOCATION UPDATING PENDING. The value of the update type IE in the message shall indicate "combined RA/LA updating". If for the last attempt to update the registration of the location area a MM specific procedure was performed, the value of the update type IE in the ROUTING AREA UPDATE REQUEST message shall indicate "combined RA/LA updating with IMSI attach". Furthermore the MS shall include the TMSI status IE if no valid TMSI is available.

A GPRS MS in MS operation modes A or B that is in an ongoing circuit-switched transaction, shall initiate the combined routing area updating procedure after the circuit-switched transaction has been released, if the MS has changed the RA during the circuit-switched transaction and if the network operates in network operation mode I.

A GPRS MS in MS operation mode A shall initiate the combined routing area updating procedure with IMSI attach after the circuit-switched transaction has been released if a GPRS attach was performed during the circuit-switched transaction and provided that the network operates in network operation mode I.

A GPRS MS in MS operation mode A shall perform the normal routing area update procedure during an ongoing circuit-switched transaction.

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the normal routing area updating procedure when it is served under UMTS area, it may set a follow-on request pending indicator on.

4.7.5.2.2 GMM Common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM authentication and ciphering procedure.

4.7.5.2.3 Combined routing area updating procedure accepted by the network

Depending on the value of the update result IE received in the ROUTING AREA UPDATE ACCEPT message, two different cases can be distinguished:

Case 1) The update result IE value indicates "combined RA/LA": Routing and location area updating is successful;

Case 2) The update result IE value indicates "RA only": Routing area updating is successful, but location area updating is not successful.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contains:

- a P-TMSI and/or a TMSI; and/or
- Receive N-PDU Numbers (see 04.65 [78] and TS 25.322).

In the latter case, the Receive N-PDU Numbers that are valid in the MS shall be included in the ROUTING AREA UPDATE COMPLETE message.

In UMTS, the network should prolong the ~~RR~~ PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the ~~RR~~ PS signalling connection without any indication from the mobile terminal.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001256

CR-Form-v3

CHANGE REQUEST

⌘ **24.007** **CR** **028** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

Title:	⌘	Alignment of 24.007 to other specs
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	01/11/00
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	Removing some editorial errors to align 24.007 to other specs
Summary of change:	⌘	Removing some LLC primitives not present in 04.64 any more. Removing the figure on anonymous PDP context activation in annex C.
Consequences if not approved:	⌘	24.007 incorrect and no aligned with other specs (04.64 and 24.008)

Clauses affected:	⌘	9.4, 10.4.1, Annex C
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

9.4 Services provided by the LLC entity for GPRS services (GSM only)

This subclause is informative, the service primitives are defined in GSM 04.64 [11a]. They are included here to provide a complete overview of the radio interface protocol architecture.

9.4.1 Service primitives for LLGMM-SAP

Table 9.4.1: Primitives and parameters at LLGMM-SAP - MS side

PRIMITIVE	PARAMETER (message, info elements of message, other parameters)	REFERENCE
LLGMM-ASSIGN-REQ	oldTLLI, newTLLI, Kc, RAND, Ciphering Algorithm	9.4.1.1
LLGMM-TRIGGER-REQ	Cause	9.4.1.2
~~LLGMM-TRIGGER-IND~~	-	~~9.4.1.3~~
LLGMM-SUSPEND-REQ	TLLI	9.4.1.4
LLGMM-RESUME-REQ	TLLI	9.4.1.5
~~LLGMM-WINDOW-REQ~~	~~TLLI, old SGSN's V(R) per SAPI~~	~~9.4.1.6~~
~~LLGMM-WINDOW-CNF~~	~~TLLI, actual MS's LLC's V(R) per SAPI~~	~~9.4.1.7~~
LL-UNITDATA-REQ	TLLI, GMM-PDU, protect, cipher	9.4.1.8
LL-UNITDATA-IND	TLLI, GMM-PDU, cipher	9.4.1.9
LLGMM-STATUS-IND	TLLI, cause	9.4.1.10

9.4.1.1 LLGMM-ASSIGN-REQ

A new TLLI and/or a ciphering key and/or a ciphering algorithm is assigned to the LLC sublayer.

9.4.1.2 LLGMM-TRIGGER-REQ

Request to send an LLC PDU to the network. Cause indicates if the primitive is sent to trigger an implicit page response.

9.4.1.3 ~~LLGMM-TRIGGER-IND~~Void

~~An LLC frame has been transmitted to the network.~~

9.4.1.4 LLGMM-SUSPEND-REQ

All LLC links in ABM mode will cease sending PDUs. GMM messages can still be sent and received.

9.4.1.5 ~~LLGMM-RESUME-REQ~~Void

~~Normal LLC frame sending and reception is possible again.~~

9.4.1.6 ~~LLGMM-WINDOW-REQ~~Void

~~Request for the MS's actual LLC's V(R)s.~~

9.4.1.7 LLGMM-WINDOW-CNF

The actual LLC's V(R)s for each LLC link in ABM mode are transferred to GMM.

9.4.1.8 LL-UNITDATA-REQ

Request to send a GMM message in unacknowledged mode to the peer entity.

9.4.1.9 LL-UNITDATA-IND

A GMM message in unacknowledged mode has been received from the peer entity.

9.4.1.10 LLGMM-STATUS-IND

Indication used by LLC to transfer LLC failures to the GMM sublayer. The failure may also be caused due to errors at the RLC/MAC layer.

###################################### NEXT SECTION ##

10.4.1 Service primitives for LLGMM-SAP

Table 10.4.1: Primitives and Parameters at GRR-SAP - network side

PRIMITIVE	PARAMETER (message, info elements of message, other parameters)	REFERENCE
LLGMM-ASSIGN-REQ	newTLLI, oldTLLI, Kc, Algorithm	10.4.1.1
~~LLGMM-TRIGGER-IND~~	~~TLLI~~	~~10.4.1.2~~
LLGMM-SUSPEND-REQ	TLLI, page	10.4.1.3
LLGMM-RESUME-REQ	TLLI	10.4.1.4
LLGMM-PAGE-IND	TLLI	10.4.1.5
LLGMM-PAGE-RESP-IND	TLLI	10.4.1.6
~~LLGMM-WINDOW-REQ~~	~~TLLI~~	~~10.4.1.7~~
~~LLGMM-WINDOW-CNF~~	~~actual LLC's N(R) per SAP~~	~~10.4.1.8~~
LL-UNITDATA-REQ	TLLI, SMM-PDU, protect, cipher	10.4.1.9
LL-UNITDATA-IND	TLLI, SMM-PDU, cipher	10.4.1.10
LLGMM-STATUS-IND	TLLI, cause	10.4.1.11

10.4.1.1 LLGMM-ASSIGN-REQ

A new TLLI and/or a ciphering key and/or a ciphering algorithm is assigned to the LL sublayer. Also an old TLLI can be unassigned.

10.4.1.2 ~~LLGMM-TRIGGER-IND~~Void

~~An LLC frame has been received from the mobile station.~~

10.4.1.3 LLGMM-SUSPEND-REQ

All LLC links will cease sending PDUs. The parameter page indicates that data shall be sent if available and therefore paging shall be needed. Or the cause indicates that data shall not be sent until a RESUME-REQ is received.

10.4.1.4 LLGMM-RESUME-REQ

Normal LLC frame sending and reception is possible again.

10.4.1.5 ~~LLGMM-WINDOW-REQ~~Void

~~Request for the actual LLC's N(R)s.~~

10.4.1.6 ~~LLGMM-WINDOW-CNF~~Void

~~The actual LLC's V(R)s for each LLC link in ABM mode are transferred to SMM.~~

10.4.1.7 LLGMM-PAGE-IND

Requires to send a paging message to the mobile station.

10.4.1.8 LLGMM-PAGE-RESP-IND

A paging response has been received from the mobile.

10.4.1.9 LL-UNITDATA-REQ

Request to send a SMM message in unacknowledged mode to the peer entity.

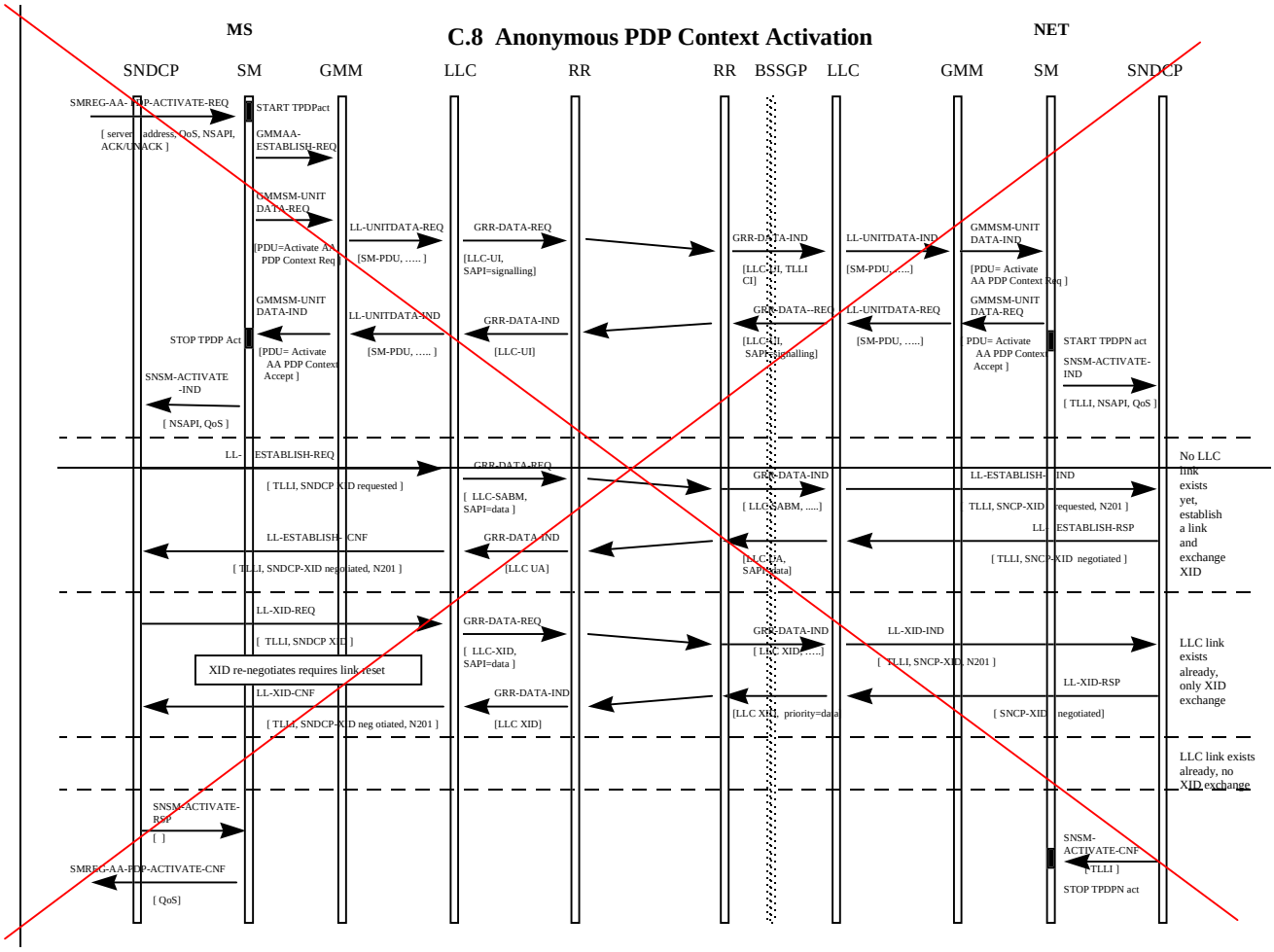
10.4.1.10 LL-UNITDATA-IND

A SMM message in unacknowledged mode has been received from the peer entity.

10.4.1.11 LLGMM-STATUS-IND

Indication used by LLC to transfer lower layer failures to the GMM sublayer.

###################################### NEXT SECTION ##


MS
C.8 Anonymous PDP Context Activation
NET
SNDCP
SM
GMM
LLC
RR
RR
BSSGP
LLC
GMM
SM
SNDCP
SMREG-AA-PDP-ACTIVATE-REQ
[server address, QoS, NSAPI, ACK/UNACK]
START TPDPact
GMMAA-ESTABLISH-REQ
GMMSM-UNIT DATA-REQ
[PDU=Activate AA PDP Context Req]
LL-UNITDATA-REQ
[SM-PDU, ...]
GRR-DATA-REQ
[LLC-UI, SAPI=signalling]
GRR-DATA-IND
[LLC-UI, TLLI CI]
LL-UNITDATA-IND
[SM-PDU, ...]
GMMSM-UNIT DATA-IND
[PDU= Activate AA PDP Context Req]
GMMSM-UNIT DATA-IND
[PDU= Activate AA PDP Context Accept]
LL-UNITDATA-REQ
[SM-PDU, ...]
GRR-DATA--REQ
[LLC-UI, SAPI=signalling]
GRR-DATA-IND
[LLC-UI]
LL-UNITDATA-IND
[SM-PDU, ...]
GMMSM-UNIT DATA-IND
[PDU= Activate AA PDP Context Accept]
STOP TPDP Act
START TPDPN act
SNSM-ACTIVATE -IND
[NSAPI, QoS]
SNSM-ACTIVATE-IND
[TLLI, NSAPI, QoS]
LL-ESTABLISH-REQ
[TLLI, SNDCP XID requested]
GRR-DATA-REQ
[LLC-SABM, SAPI=data]
GRR-DATA-IND
[LLC-SABM, ...]
LL-ESTABLISH-IND
TLLI, SNCP-XID requested, N201]
No LLC link exists yet, establish a link and exchange XID
LL-ESTABLISH-CNF
[TLLI, SNDCP-XID negotiated, N201]
GRR-DATA-IND
[LLC UA]
GRR-DATA-IND
[LLC-UA, SAPI=data]
LL-ESTABLISH-RSP
[TLLI, SNCP-XID negotiated]
LL-XID-REQ
[TLLI, SNDCP XID]
GRR-DATA-REQ
[LLC-XID, SAPI=data]
GRR-DATA-IND
[LLC XID, ...]
LL-XID-IND
[TLLI, SNCP-XID, N201]
LLC link exists already, only XID exchange
XID re-negotiates requires link reset
LL-XID-CNF
[TLLI, SNDCP-XID neg otiated, N201]
GRR-DATA-IND
[LLC XID]
LL-XID-RSP
[LLC XID, priority=data
[SNCP-XID negotiated]
LLC link exists already, no XID exchange
SNSM-ACTIVATE-RSP
[ ]
SNSM-ACTIVATE-CNF
[TLLI]
SMREG-AA-PDP-ACTIVATE-CNF
[QoS]
STOP TPDPN act

3GPP TSG-CN1 Meeting #14 ***Tdoc N1-001337***
Cardiff, Wales - 20 - 24 November, 2000

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **240** ⌘ rev **2** ⌘ Current version: **3.5.0** ⌘

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

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

Title:	⌘	Correction on TFT setting condition
Source:	⌘	Fujitsu limited
Work item code:	⌘	UMTS/GSM interworking
Date:	⌘	21/Nov/2000
Category:	⌘	**F** Critical correction
Release:	⌘	R99

Use one 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 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:	⌘	According to 23.060, even a PDP context without linked PDP context (i.e., it is an only PDP context established to an APN using a same PDP address) can have the TFT, but it is not allowed in 24.008. This modification is to align stage 3 with stage 2.
Summary of change:	⌘	PDP context without linked PDP context shall be able to have TFT.
Consequences if not approved:	⌘	TFT cannot be added to a stand-alone PDP context, and it causes inconsistency between stage 2 (23.060) and stage 3 (24.008).

Clauses affected:	⌘	9.5.10.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

9.5.10 Modify PDP context request (MS to network direction)

This message is sent by the MS to the network to request modification of an active PDP context. See table 9.5.10/TS 24.008.

Message type: MODIFY PDP CONTEXT REQUEST (MS TO NETWORK DIRECTION)

Significance: global

Direction: MS to network

Table 9.5.10/TS 24.008: modify PDP context request (MS to network direction) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2– 3/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
32	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
30	Requested new QoS	Quality of service 10.5.6.5	O	TLV	13
31	New TFT	Traffic Flow Template 10.5.6.12	O	TLV	257

9.5.10.1 Requested LLC SAPI

This IE may be included in the message to request a new LLC SAPI if a new QoS is requested.

9.5.10.2 Requested new QoS

This IE may be included in the message to request a modification of the QoS.

9.5.10.3 New TFT

This IE may be~~is~~ included in the message ~~only when multiple PDP contexts with the same PDP address and APN are active,~~ to request a new TFT or modification of ~~the~~ an existing TFT.

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Tdoc N1-001347
(revision of N1-001185)

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **016** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Subsequent Handover Procedure Corrections
Source:	⌘	Nortel Networks
Work item code:	⌘	GSM-UMTS interworking
Date:	⌘	11.21.00
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	The purpose of this CR is to add missing messages in the Subsequent handover procedure Figures.
Summary of change:	⌘	Add missing messages in the Subsequent Handover procedure Figures.
Consequences if not approved:	⌘	Incompleteness of the Subsequent Handover procedures.

Clauses affected:	⌘	Figures 15, 17, 21, 23, 27, 29, 33, 35
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

3G TS 23.009 V3.4.0 (2000-09)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Core Network; Handover procedures (Release 1999)

7.3.2 Description of the subsequent handover procedure ii): MSC-B to MSC-B'

The procedure for successful handover from MSC-B to MSC-B' is shown in figure 15.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.3.1; and
- a basic handover from MSC-A to MSC-B' as described in subclause 7.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of MSC-B'), indicating also the target cell identity and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards MSC-B'.

When MSC-A receives the ACM from MSC-B', MSC-A informs MSC-B that MSC-B' has successfuly allocated the radio resources on BSS-B' side by sending the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing the complete A-HO-REQUEST-ACKNOWLEDGE received from BSS-B'and possible extra BSSMAP information, amended by MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B' and the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B. Now MSC-B can start the procedure on the radio path.

For MSC-A the handover is completed when it has received the MAP-SEND-END-SIGNAL REQUEST from MSC-B'containing the A-HO-COMPLETE received from the BSS-B'. The circuit between MSC-A and MSC-B is released. MSC-A also sends the MAP-SEND-END-SIGNAL response to MSC-B in order to terminate the original MAP dialogue between MSC-A and MSC-B. MSC-B releases the radio resources when it receives this message.

If the traffic channel allocation is queued by the BSS-B', the A-QUEUING-INDICATION may optionaly be sent back to MSC-B. If no radio channel can be allocated by MSC-B' or no circuit between MSC-A and MSC-B' can be established or a fault is detected on the target cell identity or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, MSC-A informs MSC-B by using the A-HO-FAILURE message included in the MAP-PREPARE-SUBSEQUENT-HANDOVER response. MSC-B shall maintain the existing connection with the MS.

When the subsequent handover is completed, MSC-B' is considered as MSC-B. Any further inter-MSC handover is handled as described above for a subsequent handover.

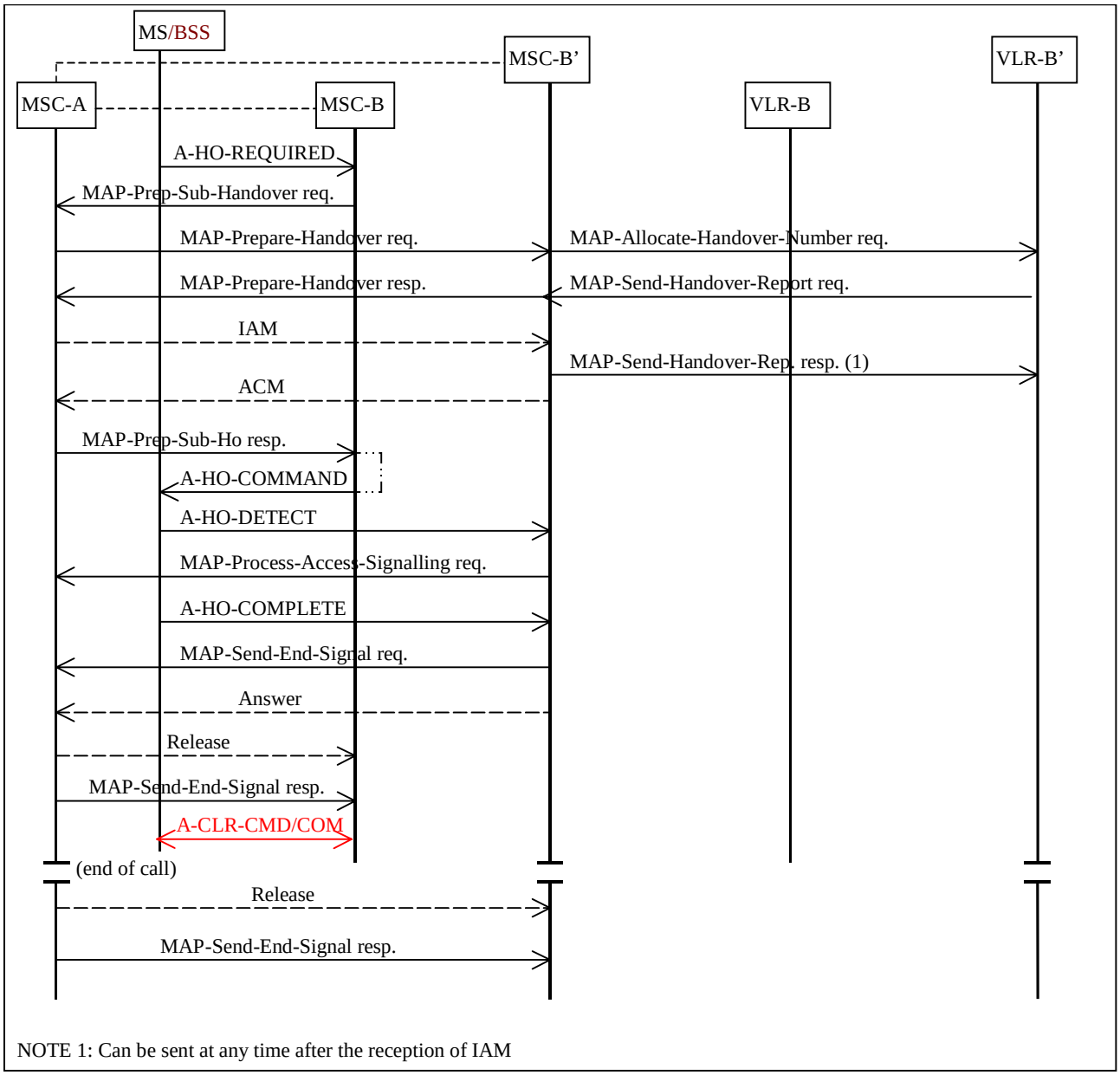


Figure 15: Subsequent handover procedure ii): Successful handover from MSC-B to MSC-B'requiring a circuit connection

*** NEXT MODIFIED SECTION ***

7.4.2 Description of the subsequent handover procedure without circuit connection ii): MSC-B to MSC-B'

The procedure for successful handover from MSC-B to MSC-B' is shown in figure 17.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.4.1; and
- a basic handover from MSC-A to MSC-B' as described in subclause 7.2.

The only difference to the equivalent figure 15 is the omission of the circuit and handover number allocation signallings.

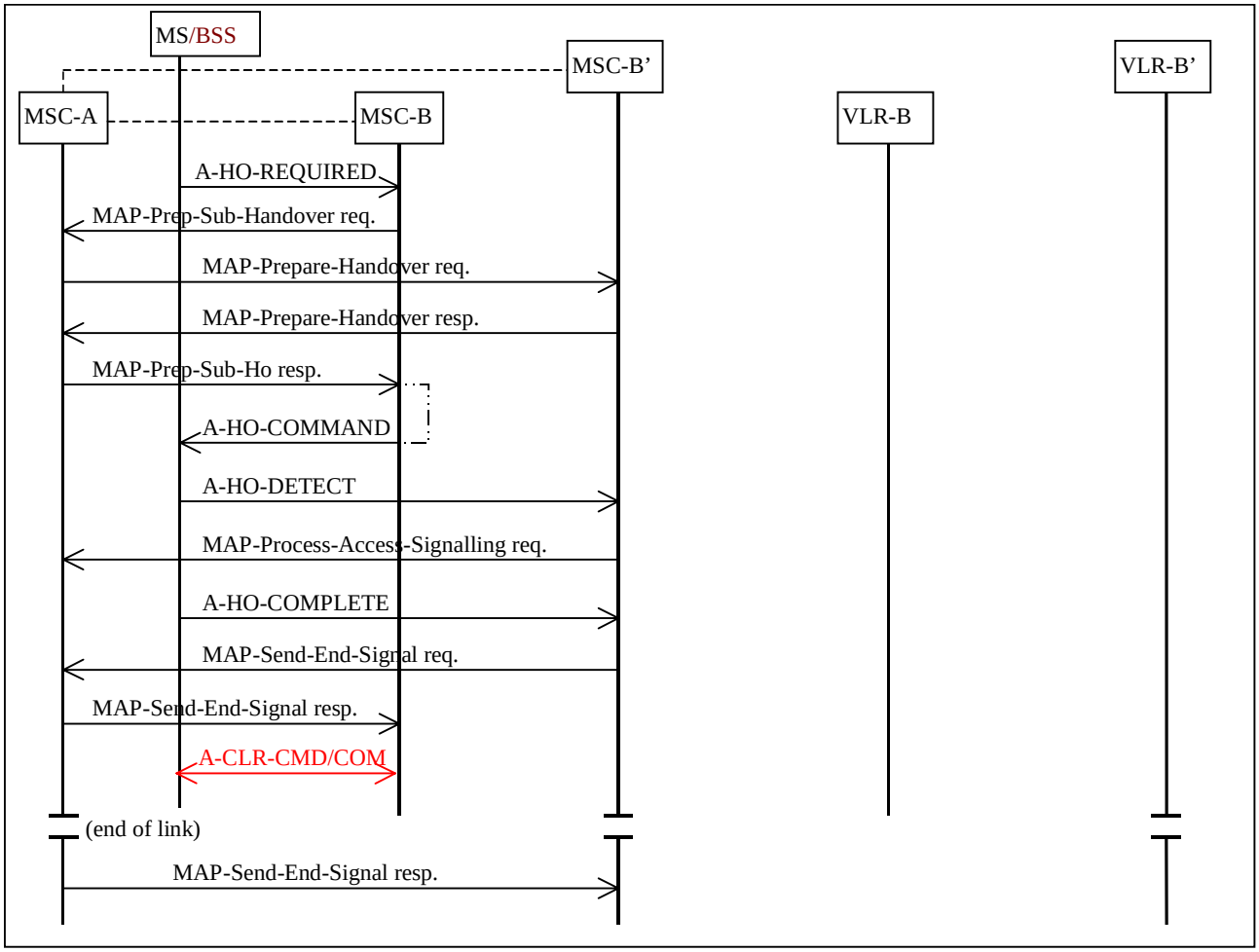


Figure 17: Subsequent handover procedure ii): Successful handover from MSC-B to MSC-B' without circuit connection

*** NEXT MODIFIED SECTION ***

8.1.3.2 Description of subsequent UMTS to GSM handover procedure ii): 3G_MSC-B to MSC-B'

The procedure for successful UMTS to GSM handover from 3G_MSC-B to MSC-B' is shown in figure 21.

The procedure consists of two parts:

- a subsequent UMTS to GSM handover from 3G_MSC-B back to 3G_MSC-A as described in subclause 8.1.3.1 (3G_MSC-A can also be a pure GSM MSC, the procedure is the same in both casess); and
- a basic handover from 3G_MSC-A to MSC-B' as described in subclause 7.1.

8.1.3.2.1 With one circuit connection

8.1.3.2.2 With multiple circuit connections (Optional functionality)

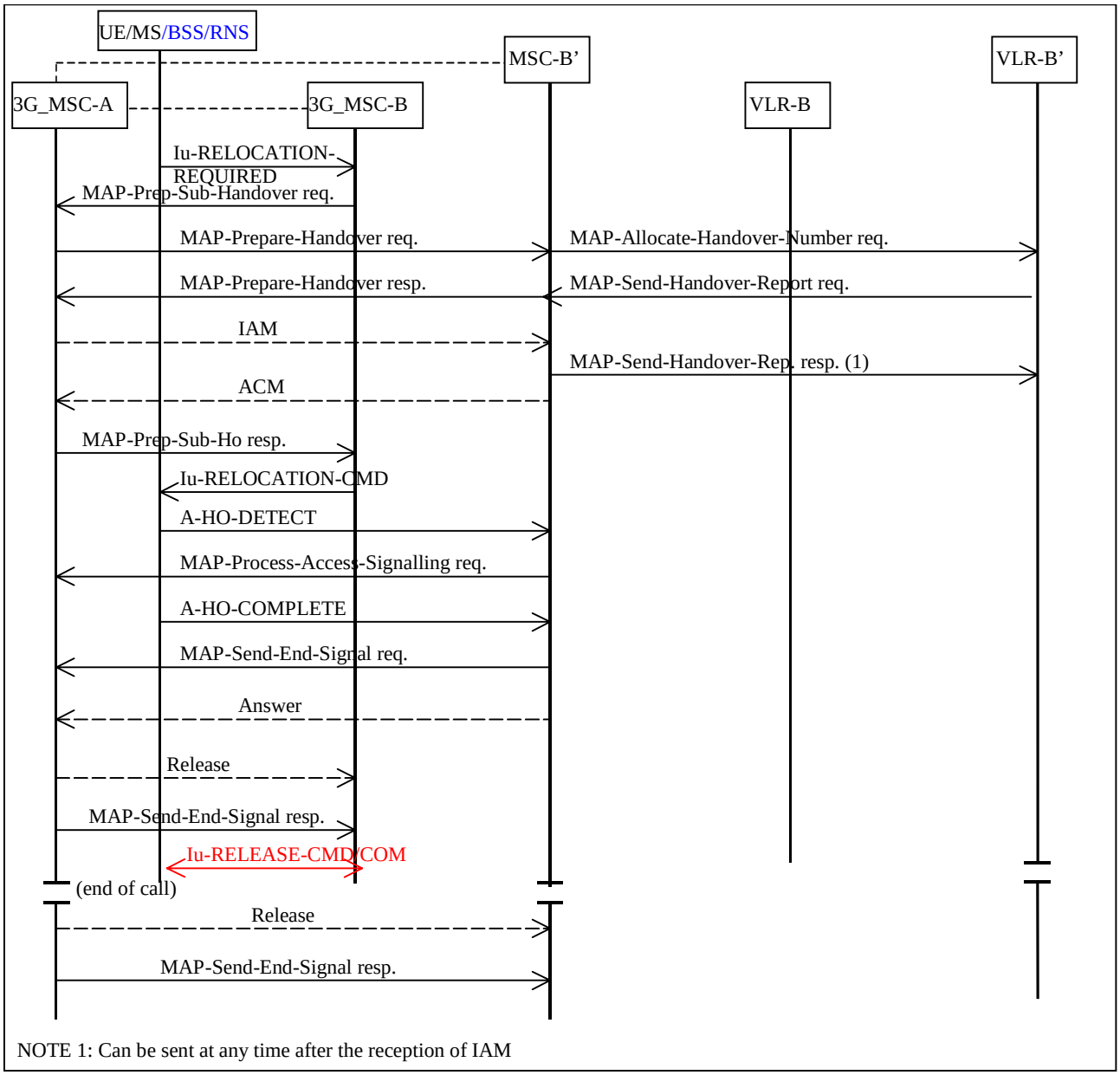


Figure 21: Subsequent handover procedure ii): Successful UMTS to GSM handover from 3G_MSC-B to MSC-B' requiring a circuit connection

*** NEXT MODIFIED SECTION ***

8.1.4.2 Description of the subsequent UMTS to GSM handover procedure without circuit connection ii): 3G_MSC-B to MSC-B'

The procedure for successful UMTS to GSM handover from 3G_MSC-B to MSC-B' is shown in figure 23.

The procedure consists of two parts:

- a subsequent UMTS to GSM handover from 3G_MSC-B back to 3G_MSC-A as described in subclause 8.1.4.1 (3G_MSC-A can also be a pure GSM MSC, the procedure is the same in both casess); and
- a basic handover from 3G_MSC-A to MSC-B' as described in subclause 7.2.

The only difference to the equivalent figure 21 is the omission of the circuit and handover number allocation signallings.

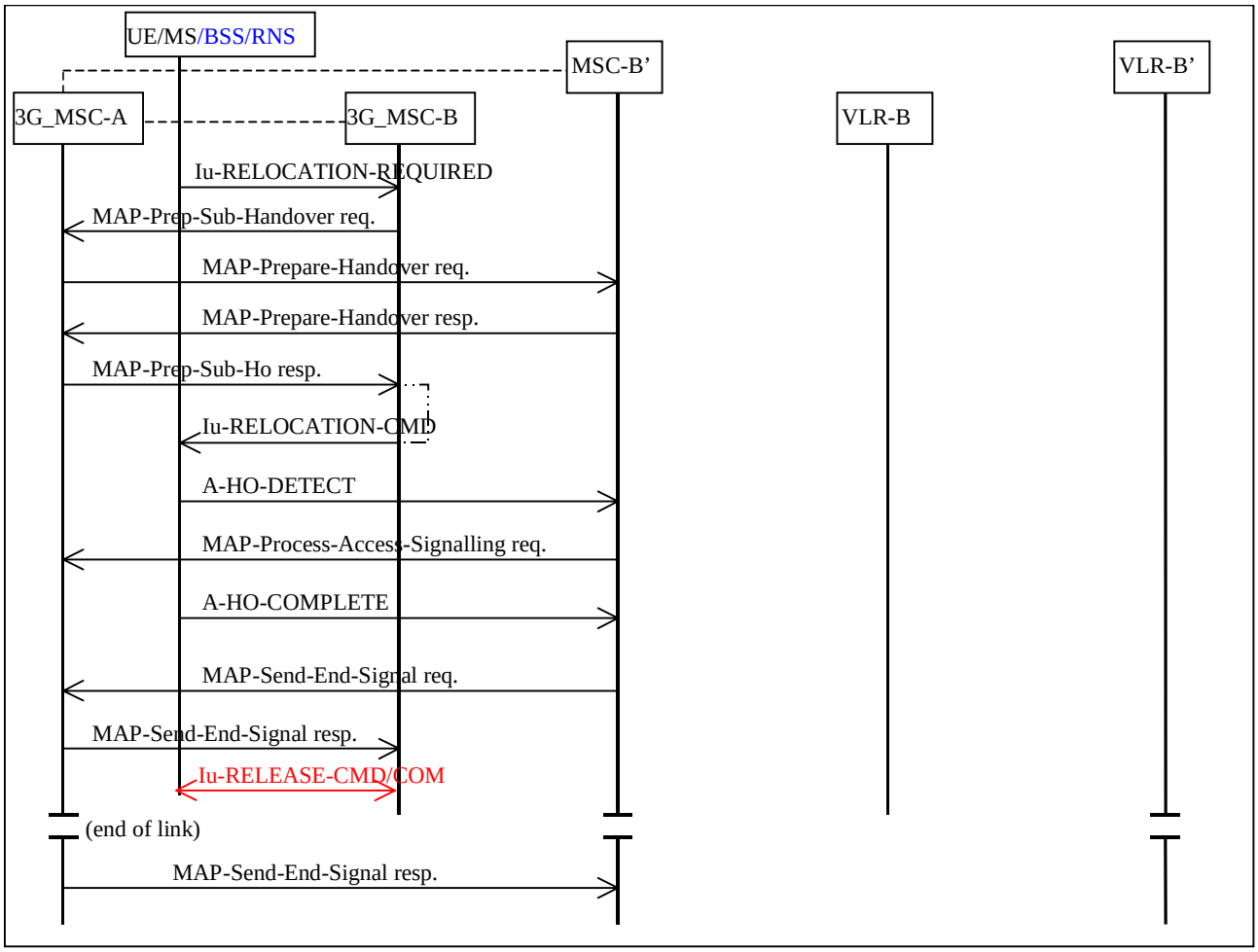


Figure 23: Subsequent UMTS to GSM handover procedure ii): Successful UMTS to GSM handover from 3G_MSC-B to MSC-B' without circuit connection

*** NEXT MODIFIED SECTION ***

8.2.3.2 Description of subsequent GSM to UMTS handover procedure ii): MSC-B to 3G_MSC-B''

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 27.The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.3.1 (MSC-A can also be a 3G_MSC, the procedure is the same in both cases); and
- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in subclause 8.2.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of 3G_MSC-B'), indicating also the target cell identity and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards 3G_MSC-B'.

When MSC-A receives the ACM from 3G_MSC-B', MSC-A informs MSC-B that 3G_MSC-B' has successfully allocated the radio resources on RNS-B' side by sending the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing the complete A-HO-REQUEST-ACK generated from the RELOCATION-REQUEST-ACK received from RNS-B' and possible extra BSSMAP information, amended by MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface between MSC-A and 3G_MSC-B' and the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B. Now MSC-B can start the procedure on the radio path.

For MSC-A the handover is completed when it has received the MAP-SEND-END-SIGNAL REQUEST from 3G_MSC-B' containing the A-HO-COMPLETE generated from Iu-RECOLATION COMPLETE received from the RNS-B'. The circuit between MSC-A and MSC-B is released. MSC-A also sends the MAP-SEND-END-SIGNAL response to MSC-B in order to terminate the original MAP dialogue between MSC-A and MSC-B. MSC-B releases the radio resources when it receives this message.

If no radio resources can be allocated by 3G_MSC-B' or no circuit between MSC-A and 3G_MSC-B' can be established or a fault is detected on the target cell identity or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, MSC-A informs MSC-B by using the A-HO-FAILURE message included in the MAP-PREPARE-SUBSEQUENT-HANDOVER response. MSC-B shall maintain the existing connection with the UE/MS.

When the subsequent GSM to UMTS handover is completed, 3G_MSC-B' is considered as 3G_MSC-B. Any further inter-MSC handover is handled as described above for a subsequent handover.

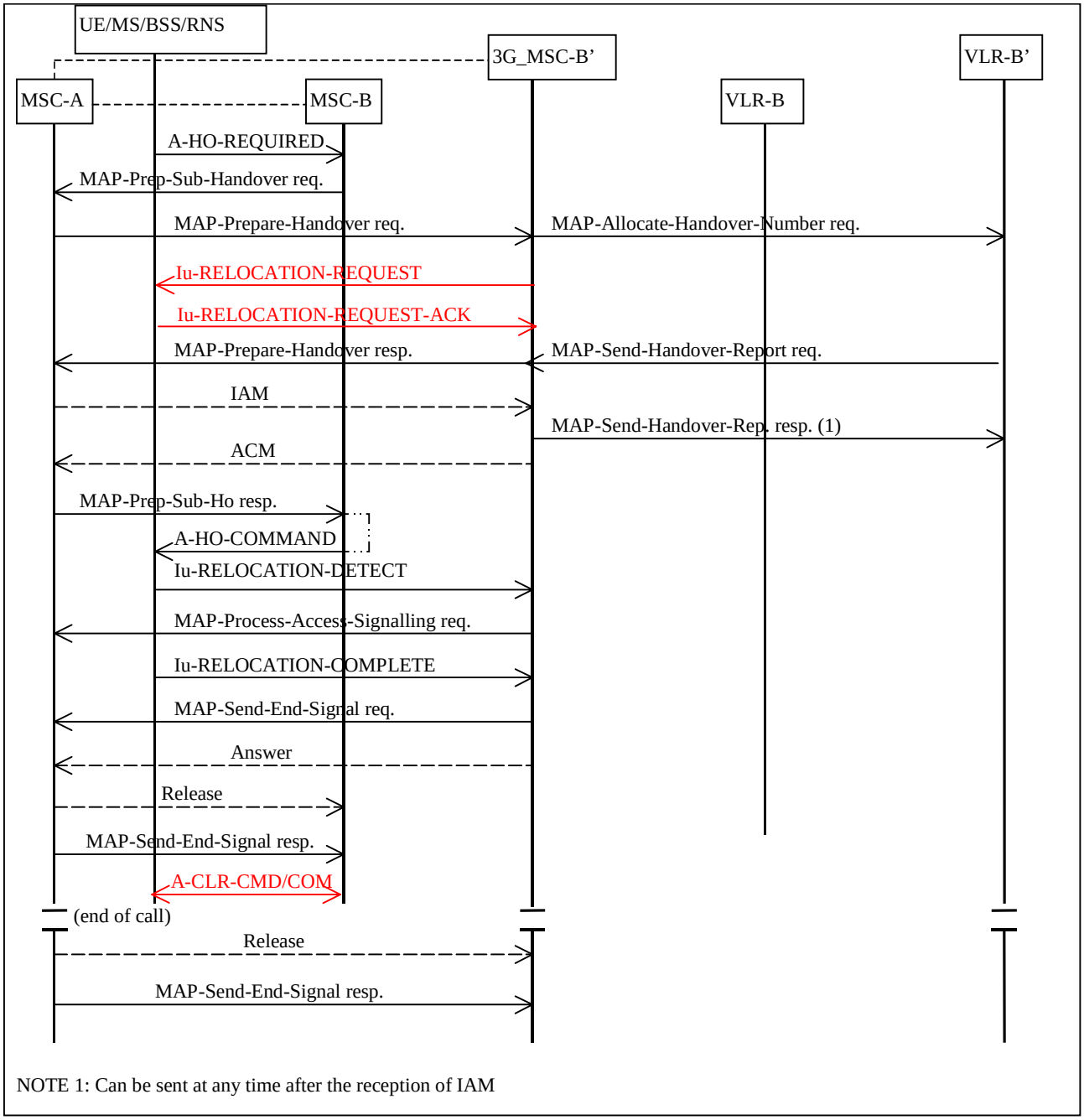


Figure 27: Subsequent GSM to UMTS handover procedure ii): Successful handover from MSC-B to 3G_MSC-B' requiring a circuit connection

*** NEXT MODIFIED SECTION ***

8.2.4.2 Description of subsequent GSM to UMTS handover procedure without circuit connection ii): MSC-B to 3G_MSC-B'

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 29.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.4.1 (MSC-A can also be a 3G_MSC, the procedure is the same in both cases); and
- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in subclause 8.2.2.

The only difference to the equivalent figure 27 is the omission of the circuit and handover number allocation signallings.

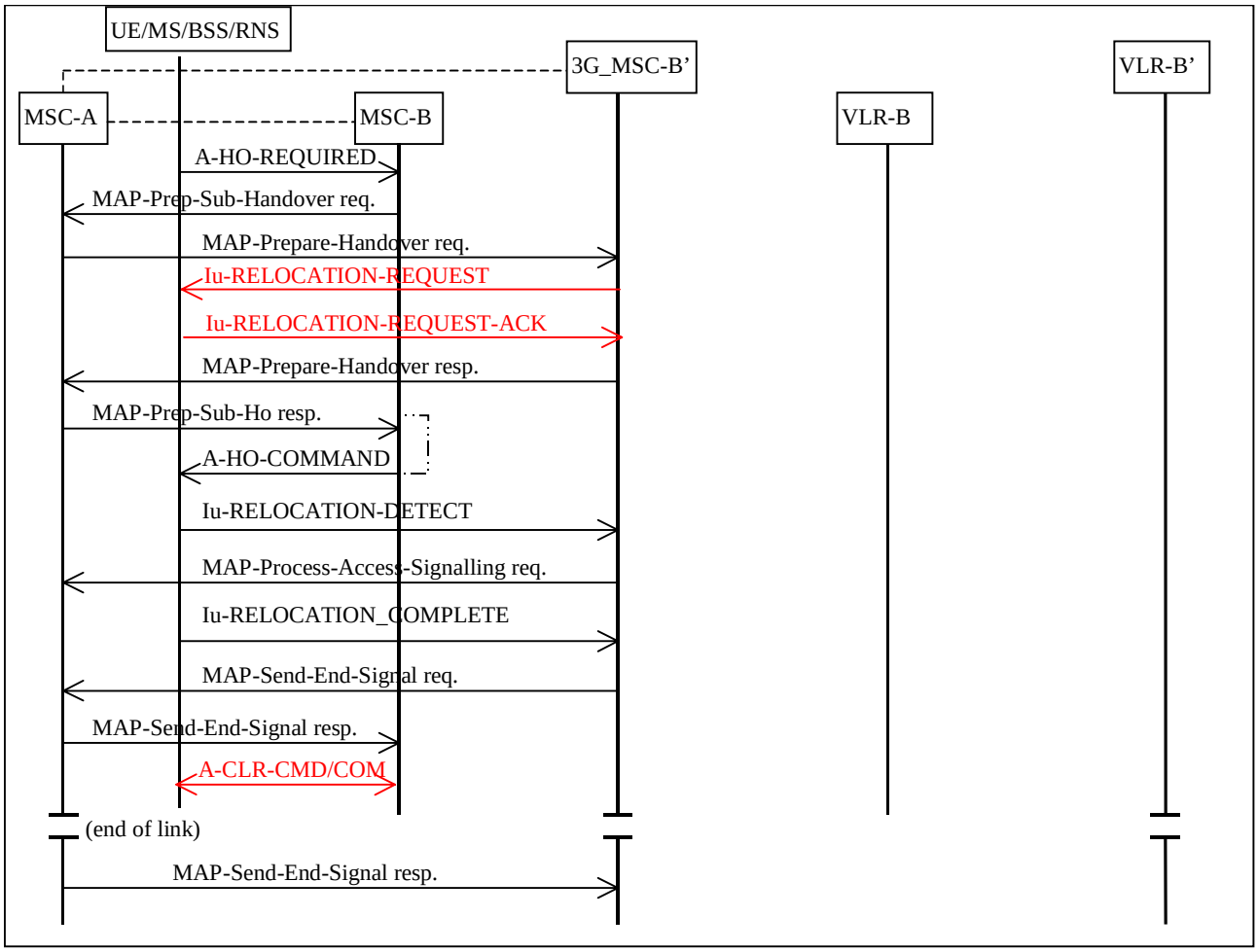


Figure 29: Subsequent GSM to UMTS handover procedure ii): Successful handover from MSC-B to 3G_MSC-B' without circuit connection

*** NEXT MODIFIED SECTION ***

8.3.3.2 Description of subsequent relocation procedure ii): 3G_MSC-B to 3G_MSC-B'

The procedure for successful relocation from 3G_MSC-B to 3G_MSC-B' is shown in figure 33.

The procedure consists of two parts:

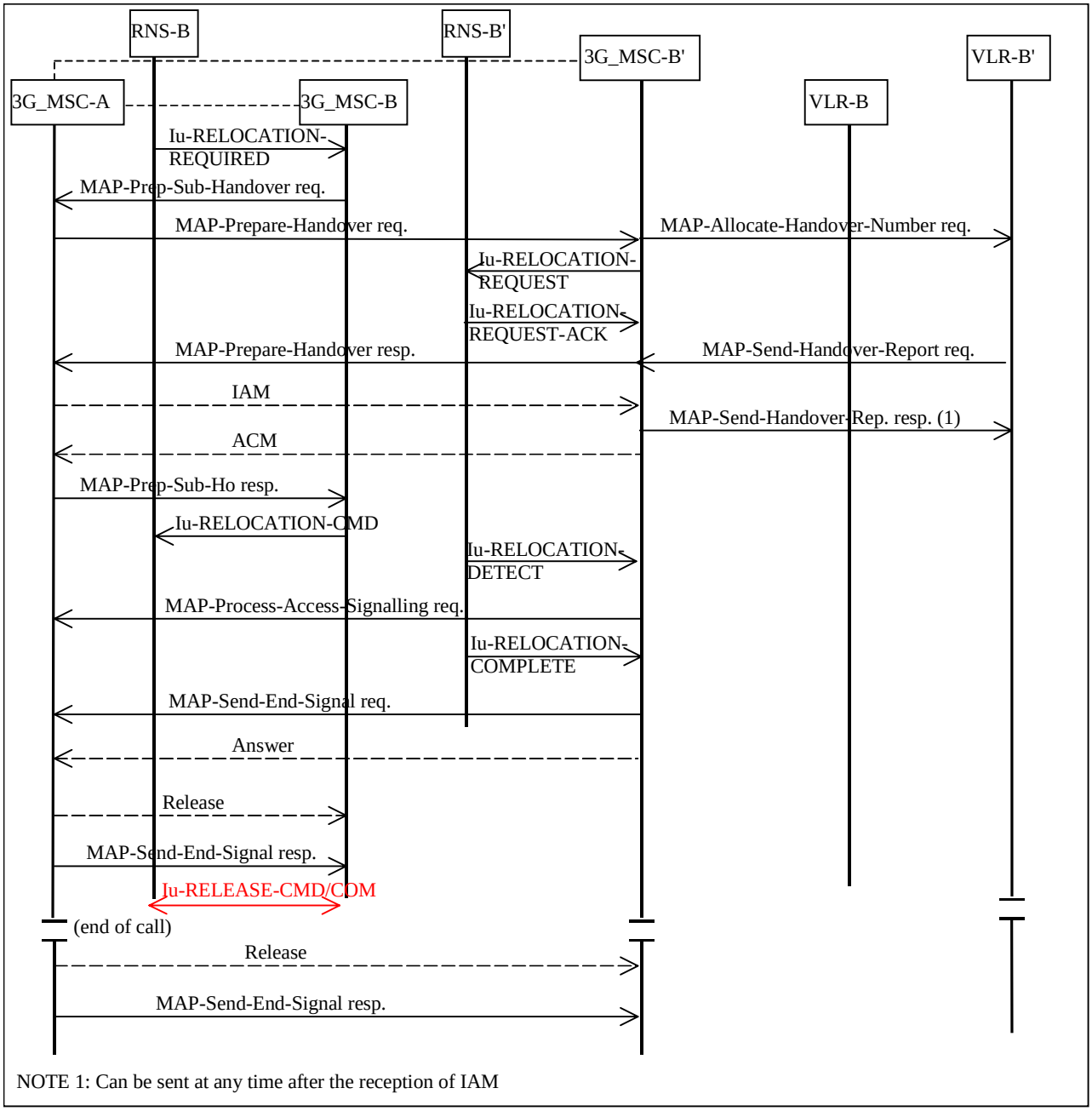
- a subsequent relocation from 3G_MSC-B back to 3G_MSC-A as described in subclause 8.3.3.1; and
- a basic relocation from 3G_MSC-A to 3G_MSC-B' as described in subclause 8.3.1.

8.3.3.2.1 With one circuit connection

8.3.3.2.2 With multiple circuit connections (Optional functionality)

8.3.3.2.2.1 3G_MSC-B' does not support multiple bearers

8.3.3.2.2.2 3G_MSC-B' supports multiple bearers



NOTE 1: Can be sent at any time after the reception of IAM

Figure 33: Subsequent relocation procedure ii) Successful SRNS relocation from 3G_MSC-B to 3G_MSC-B' requiring a circuit connection

*** NEXT MODIFIED SECTION ***

8.3.4.2 Description of subsequent relocation procedure ii): 3G_MSC-B to 3G_MSC-B''

The procedure for successful relocation from 3G_MSC-B to 3G_MSC-B' is shown in figure 35.

The procedure consists of two parts:

- a subsequent relocation from 3G_MSC-B back to 3G_MSC-A as described in subclause 8.3.4.1; and
- a basic relocation from 3G_MSC-A to 3G_MSC-B' as described in subclause 8.3.2.

The only difference to the equivalent figure 33 is the omission of the circuit and handover number allocation signallings.

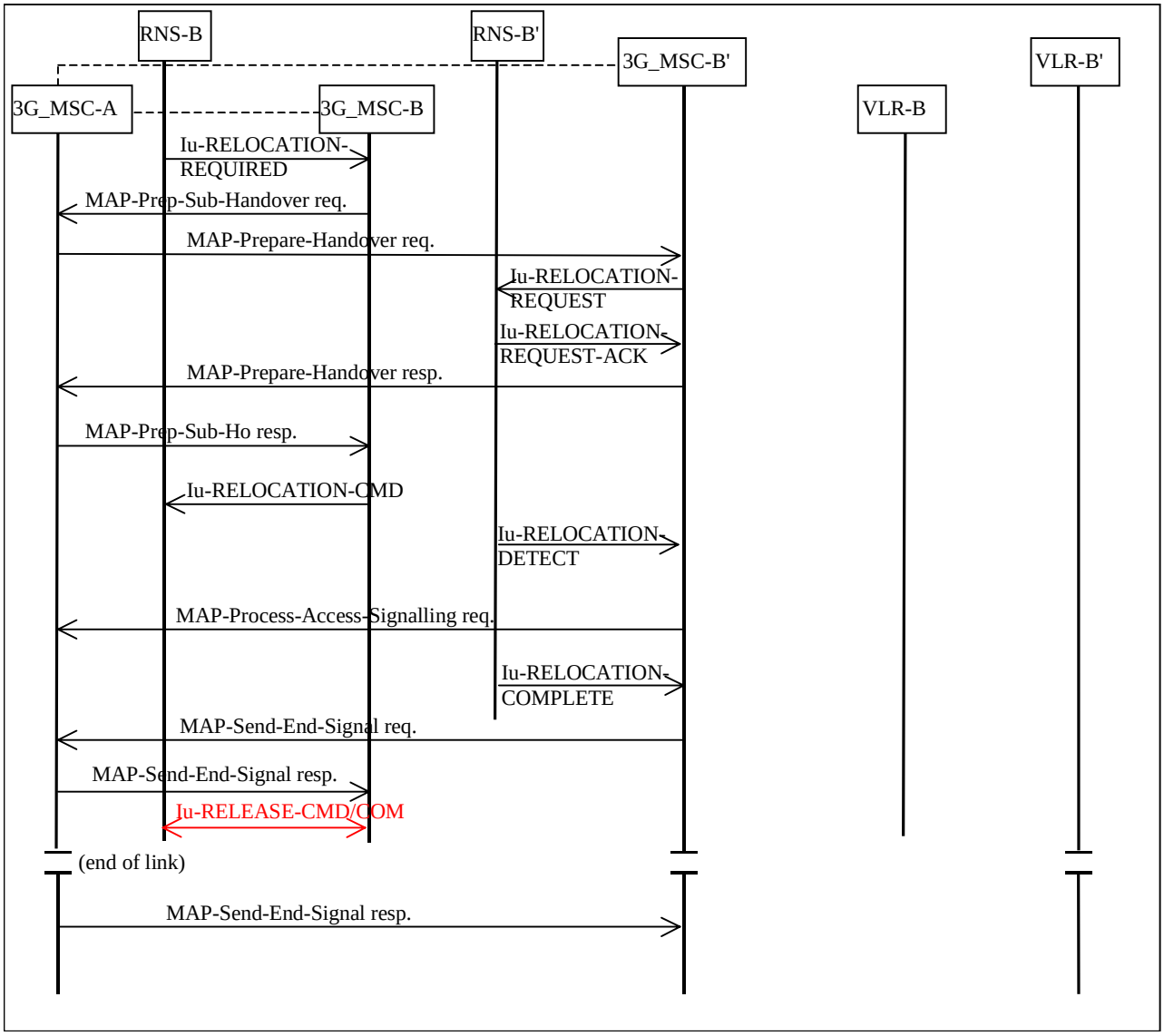


Figure 35: Subsequent relocation procedure ii) Successful SRNS relocation from 3G_MSC-B to 3G_MSC-B' not requiring a circuit connection

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Tdoc N1-001361~~1268~~

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **294** ⌘ rev **r1** ⌘ Current version: **3.5.0** ⌘

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

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

Title:	⌘	Updating of Bearer Capability IE
Source:	⌘	Ericsson
Work item code:	⌘	~~TEI~~GSM/UMTS interworking
Date:	⌘	2000-11-23
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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: ⌘ For adaptation with the latest TS 27.001(V3.6.0) specification, the bearer capability IE in TS 24.008 should be updated.

Summary of change: ⌘ The following changes are needed for adaptation.

- Removal of X.21 and X.28 protocol from the Signalling Access Protocol.
- Removal of barriers to use the 32 kbit/s in GSM.
- Addition of relevance of GSM specific BC-IE parameters for renegotiating the RLP version during a call in case of handover to GSM.

Consequences if not approved: ⌘ Inconsistency between 27.001 and 24.008.

Clauses affected: ⌘ 10.5.4.5

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

********** MODIFIED SECTION**********

10.5.4.5 Bearer capability

The purpose of the bearer capability information element is to describe a bearer service. The use of the bearer capability information element in relation to compatibility checking is described in annex B.

The bearer capability information element is coded as shown in figure 10.5.88/TS 24.008 and tables 10.5.102/TS 24.008 to 10.5.115/TS 24.008.

The bearer capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 16 octets.

8	7	6	5	4	3	2	1	
	Bearer capability IEI							octet 1
Length of the bearer capability contents								octet 2
0/1 ext	radio channel requirement		co-ding std	trans fer mode	information transfer capability			octet 3
0/1 ext	0 co-ding	0 spare		0	speech version indication			octet 3a etc*
1 ext	comp -ress.	structure		dupl. mode	confi gur.	NIRR	esta-bli.	octet 4*
0/1 ext	0 access id.	0	rate adaption		signalling access protocol			octet 5*
0/1 ext	Other ITC		Other rate adaption		0 Spare	0	0	octet 5a*
1 ext	Hdr/ noHdr	Multi frame	Mode	LLI	Assig nor/e	Inb. neg	0 Spare	octet 5b*
0/1 ext	0 layer 1 id.	1	User information layer 1 protocol				sync/ async	octet 6*
0/1 ext	numb. stop bits	nego-tia-tion	numb. data bits	user rate				octet 6a*
0/1 ext	intermed. rate		NIC on TX	NIC on RX	Parity			octet 6b*
0/1 ext	connection element		modem type					octet 6c*
0/1 ext	Other modem type		Fixed network user rate					octet 6d*
0/1 ext	Acceptable channel codings				Maximum number of traffic channels			octet 6e*
0/1 ext	UIMI			Wanted air interface user rate				octet 6f*
1 ext	Acceptable channel codings extended			Asymmetry Indication		0 Spare	0	octet 6g*
1 ext	1 layer 2 id.	0	User information layer 2 protocol					octet 7*

Figure 10.5.88/TS 24.008 Bearer capability information element

NOTEs: The coding of the octets of the bearer capability information element is not conforming to ITU Q.931.

An MS shall encode the Bearer Capability infomation element according to GSM call control requirements also if it is requesting for a UMTS service.

For UTRAN access the following parameters ~~is~~are irrelevant, because multiple traffic channels (multislot) are not deployed [TS 23.034]. -The ~~multislot~~ parameters shall, however, be stored in MSC, and forwarded at handover:

~~- Maximum number of traffic channels (octet 6e, bits 1-3)~~
~~- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)~~
- UIMI, User initiated modification indication (octet 6f, bits 5-7).
~~- Acceptable Channel Codings extended (octet 6g, bits 5-7)~~

The following parameters are relevant in UMTS for non transparent data calls for deciding which RLP version to negotiate in order to avoid renegotiation of RLP version in case of inter-system handover, see 3GPP TS 24.022 [9]. They are otherwise irrelevant for specifying the UTRAN radio access bearer:

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)
- Acceptable Channel Codings extended (octet 6g, bits 5-7).

A mobile station not supporting GSM shall set the following ~~these~~ parameters to the value "0".~~:~~

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)
- UIMI, User initiated modification indication (octet 6f, bits 5-7)
- Acceptable Channel Codings extended (octet 6g, bits 5-7).

********** MODIFIED TABLE**********

Table 10.5.105/TS 24.008: Bearer capability information element

Access identity (octet 5)
Bits
7 6
0 0 octet identifier

All other values are reserved

Rate adaption (octet 5)
Bits
5 4
0 0 no rate adaption
0 1 V.110, I.460/X.30 rate adaptation
1 0 ITU-T X.31 flag stuffing
1 1 Other rate adaption (see octet 5a)

Signalling access protocol (octet 5)

Bits
3 2 1
0 0 1 I.440/450
0 1 0 ~~X.21~~ reserved: was allocated in earlier phases of the protocol
0 1 1 reserved: was allocated in earlier phases of the protocol
1 0 0 reserved: was allocated in earlier phases of the protocol.
1 0 1 ~~X.28 - non dedicated PAD~~ reserved: was allocated in earlier phases of the protocol
1 1 0 X.32

All other values are reserved.

********** NEXT MODIFIED TABLE**********

Table 10.5.111/TS 24.008: Bearer capability information element

Connection element (octet 6c)
Bit
7 6
0 0 transparent
0 1 non transparent (RLP)
1 0 both, transparent preferred
1 1 both, non transparent preferred

The requesting end (e.g. the one sending the SETUP message) should use the 4 values depending on its capabilities to support the different modes. The answering party shall only use the codings 00 or 01, based on its own capabilities and the proposed choice if any. If both MS and network support both transparent and non transparent, priority should be given to the MS preference.

Modem type (octet 6c)
Bits
5 4 3 2 1
0 0 0 0 0 none
0 0 0 0 1 V.21 (note 1)
0 0 0 1 0 V.22 (note 1)
0 0 0 1 1 V.22 bis (note 1)
0 0 1 0 0 reserved: was allocated in earlier phases of the protocol
0 0 1 0 1 V.26 ter (note 1)
0 0 1 1 0 V.320 0 1 1 1 modem for undefined interface
0 1 0 0 0 autobauding type 1

All other values are reserved.
Note 1: In GSM only.

Table 10.5.112/TS 24.008: Bearer capability information element

Other modem type (octet 6d)
Bits
7 6
0 0 no other modem type specified in this field
1 0 V.34

All other values are reserved.

Fixed network user rate (octet 6d)
Bit
5 4 3 2 1
0 0 0 0 0 Fixed network user rate not applicable/No meaning is associated with this value.
0 0 0 0 1 9.6 kbit/s Recommendation X.1 and V.110
0 0 0 1 0 14.4 kbit/s Recommendation X.1 and V.110
0 0 0 1 1 19.2 kbit/s Recommendation X.1 and V.110
0 0 1 0 0 28.8 kbit/s Recommendation X.1 and V.110
0 0 1 0 1 38.4 kbit/s Recommendation X.1 and V.1100 0 1 1 0 48.0 kbit/s Recommendation X.1 and V.110(synch) (note 1)
0 0 1 1 1 56.0 kbit/s Recommendation X.1 and V.110(synch) /bit transparent
0 1 0 0 0 64.0 kbit/s bit transparent
0 1 0 0 1 33.6 kbit/s bit transparent (note 2)
0 1 0 1 0 32.0 kbit/s Recommendation I.460 ~~note 2~~
0 1 0 1 1 31.2 kbit/s Recommendation V.34 (note 2)

The value 31.2 kbit/s Recommendation V.34 shall be used only by the network to inform the MS about FNUR modification due to negotiation between the modems in a 3.1 kHz multimedia call.

All other values are reserved.
Note 1: In GSM only.
Note 2: In UMTS only

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-0013621269

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **295** ⌘ rev **r1** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Updating of Bearer Capability IE
Source:	⌘	Ericsson
Work item code:	⌘	~~TEI~~GSM/UMTS interworking
Date:	⌘	2000-11-23
Category:	⌘	**F**
Release:	⌘	REL-4

Use one 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 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: ⌘ For adaptation with the latest TS 27.001(V4.1.0) specification, the bearer capability IE in TS 24.008 should be updated.

Summary of change: ⌘ The following changes are needed for adaptation.

- Removal of X.21 and X.28 protocol from the Signalling Access Protocol.
- Removal of barriers to use the 32 kbit/s in GSM.
- Addition of relevance of GSM specific BC-IE parameters for renegotiating the RLP version during a call in case of handover to GSM.

Consequences if not approved: ⌘ Inconsistency between 27.001 and 24.008.

Clauses affected: ⌘ 10.5.4.5

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

********** MODIFIED SECTION**********

10.5.4.5 Bearer capability

The purpose of the bearer capability information element is to describe a bearer service. The use of the bearer capability information element in relation to compatibility checking is described in annex B.

The bearer capability information element is coded as shown in figure 10.5.88/TS 24.008 and tables 10.5.102/TS 24.008 to 10.5.115/TS 24.008.

The bearer capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 16 octets.

8	7	6	5	4	3	2	1	
	Bearer capability IEI							octet 1
Length of the bearer capability contents								octet 2
0/1 ext	radio channel requirement		co-ding std	trans fer mode	information transfer capability			octet 3
0/1 ext	0 co-ding	0 spare		0	speech version indication			octet 3a etc*
1 ext	comp -ress.	structure		dupl. mode	confi gur.	NIRR	esta-bli.	octet 4*
0/1 ext	0 access id.	0	rate adaption		signalling access protocol			octet 5*
0/1 ext	Other ITC		Other rate adaption		0 Spare	0	0	octet 5a*
1 ext	Hdr/ noHdr	Multi frame	Mode	LLI	Assig nor/e	Inb. neg	0 Spare	octet 5b*
0/1 ext	0 layer 1 id.	1	User information layer 1 protocol				sync/ async	octet 6*
0/1 ext	numb. stop bits	nego-tia-tion	numb. data bits	user rate				octet 6a*
0/1 ext	intermed. rate		NIC on TX	NIC on RX	Parity			octet 6b*
0/1 ext	connection element		modem type					octet 6c*
0/1 ext	Other modem type		Fixed network user rate					octet 6d*
0/1 ext	Acceptable channel codings				Maximum number of traffic channels			octet 6e*
0/1 ext	UIMI			Wanted air interface user rate				octet 6f*
1 ext	Acceptable channel codings extended			Asymmetry Indication		0 Spare	0	octet 6g*
1 ext	1 layer 2 id.	0	User information layer 2 protocol					octet 7*

Figure 10.5.88/TS 24.008 Bearer capability information element

NOTEs: The coding of the octets of the bearer capability information element is not conforming to ITU Q.931.

An MS shall encode the Bearer Capability infomation element according to GSM call control requirements also if it is requesting for a UMTS service.

For UTRAN access the following parameters ~~is~~are irrelevant, because multiple traffic channels (multislot) are not deployed [TS 23.034]. -The ~~multislot~~ parameters shall, however, be stored in MSC, and forwarded at handover:

~~- Maximum number of traffic channels (octet 6e, bits 1-3)~~
~~- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)~~
- UIMI, User initiated modification indication (octet 6f, bits 5-7).
~~- Acceptable Channel Codings extended (octet 6g, bits 5-7)~~

The following parameters are relevant in UMTS for non transparent data calls for deciding which RLP version to negotiate in order to avoid renegotiation of RLP version in case of inter-system handover, see 3GPP TS 24.022 [9]. They are otherwise irrelevant for specifying the UTRAN radio access bearer:

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)
- Acceptable Channel Codings extended (octet 6g, bits 5-7).

A mobile station not supporting GSM shall set the following ~~these~~ parameters to the value "0".~~:~~

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)
- UIMI, User initiated modification indication (octet 6f, bits 5-7)
- Acceptable Channel Codings extended (octet 6g, bits 5-7).

********** MODIFIED TABLE**********

Table 10.5.105/TS 24.008: Bearer capability information element

Access identity (octet 5)
Bits
7 6
0 0 octet identifier

All other values are reserved

Rate adaption (octet 5)
Bits
5 4
0 0 no rate adaption
0 1 V.110, I.460/X.30 rate adaptation
1 0 ITU-T X.31 flag stuffing
1 1 Other rate adaption (see octet 5a)

Signalling access protocol (octet 5)

Bits
3 2 1
0 0 1 I.440/450
0 1 0 ~~X.21~~ reserved: was allocated in earlier phases of the protocol
0 1 1 reserved: was allocated in earlier phases of the protocol
1 0 0 reserved: was allocated in earlier phases of the protocol.
1 0 1 ~~X.28 - non dedicated PAD~~ reserved: was allocated in earlier phases of the protocol
1 1 0 X.32

All other values are reserved.

********** NEXT MODIFIED TABLE**********

Table 10.5.111/TS 24.008: Bearer capability information element

Connection element (octet 6c)
Bit
7 6
0 0 transparent
0 1 non transparent (RLP)
1 0 both, transparent preferred
1 1 both, non transparent preferred

The requesting end (e.g. the one sending the SETUP message) should use the 4 values depending on its capabilities to support the different modes. The answering party shall only use the codings 00 or 01, based on its own capabilities and the proposed choice if any. If both MS and network support both transparent and non transparent, priority should be given to the MS preference.

Modem type (octet 6c)
Bits
5 4 3 2 1
0 0 0 0 0 none
0 0 0 0 1 V.21 (note 1)
0 0 0 1 0 V.22 (note 1)
0 0 0 1 1 V.22 bis (note 1)
0 0 1 0 0 reserved: was allocated in earlier phases of the protocol
0 0 1 0 1 V.26 ter (note 1)
0 0 1 1 0 V.320 0 1 1 1 modem for undefined interface
0 1 0 0 0 autobauding type 1

All other values are reserved.
Note 1: In GSM only.

Table 10.5.112/TS 24.008: Bearer capability information element

Other modem type (octet 6d)
Bits
7 6
0 0 no other modem type specified in this field
1 0 V.34

All other values are reserved.

Fixed network user rate (octet 6d)
Bit
5 4 3 2 1
0 0 0 0 0 Fixed network user rate not applicable/No meaning is associated with this value.
0 0 0 0 1 9.6 kbit/s Recommendation X.1 and V.110
0 0 0 1 0 14.4 kbit/s Recommendation X.1 and V.110
0 0 0 1 1 19.2 kbit/s Recommendation X.1 and V.110
0 0 1 0 0 28.8 kbit/s Recommendation X.1 and V.110
0 0 1 0 1 38.4 kbit/s Recommendation X.1 and V.1100 0 1 1 0 48.0 kbit/s Recommendation X.1 and V.110(synch) (note 1)
0 0 1 1 1 56.0 kbit/s Recommendation X.1 and V.110(synch) /bit transparent
0 1 0 0 0 64.0 kbit/s bit transparent
0 1 0 0 1 33.6 kbit/s bit transparent (note 2)
0 1 0 1 0 32.0 kbit/s Recommendation I.460 ~~note 2~~
0 1 0 1 1 31.2 kbit/s Recommendation V.34 (note 2)

The value 31.2 kbit/s Recommendation V.34 shall be used only by the network to inform the MS about FNUR modification due to negotiation between the modems in a 3.1 kHz multimedia call.

All other values are reserved.
Note 1: In GSM only.
Note 2: In UMTS only

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Revised Tdoc N1-001320

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **020** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Indication of Intra-3G-MSC InterSystem handover, from 3G_MSC-B to MSC-A/3G_MSC-A
Source:	⌘	Nokia
Work item code:	⌘	GSM-UMTS interworking
Date:	⌘	22.11.2000
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	For 3G MSC-B to inform MSC-A or 3G MSC-A of a subsequent intersystem intra-3G-MSC handover after an inter-MSC handover, TSG CN WG4 agreed that it is preferable to use the BSSMAP Handover Performed message over MAP-E rather than to introduce a new MAP message. The Cell Identifier IE of the BSSMAP Handover Performed message should be used by MSC-A or 3G MSC-A to know whether the handover is to UTRAN (RNC Id given) or to GSM BSS (Cell identity), and the Chosen Channel IE should be used by the MSC-A or 3G MSC-A to know the channel type in case of handover to GSM BSS.
Summary of change:	⌘	Section 4.4.1 Role of 3G_MSC-B: 3G MSC-B notifies MSC-A or 3G MSC-A of intra 3G MSC-B InterSystem handover by using the A_HANDOVER_PERFORMED message. Section 4.2.1 Role of MSC-B: MSC-B notifies MSC-A or 3G MSC-A of successful intra -MSC-B handover completion by using the A_HANDOVER_PERFORMED message.
Consequences if not approved:	⌘	When an inter-MSC handover for CS data call is made, the used IWF resides with MSC-A/3G_MSC-A. When an intra-MSC intersystem handover is made within 3G_MSC-B, the IWF is not informed about the type of the GERAN channel. Consequently, the data transmission fails after the handover.

Clauses affected:	⌘	4.2.1, 4.4.1
Other specs	⌘ ☐	Other core specifications ⌘

affected:	☐ Test specifications ☐ O&M Specifications	
Other comments: ⌘		

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

Modified section

4.2 MSC-B

4.2.1 Role of MSC-B

In the Intra-MSC handover case, the MSC-B keeps the control of the whole Intra-MSC handover procedure.

~~MSC-A, or 3G_MSC-A in the case of a previous inter-system, is only notified on the successful completion of the Intra-MSC handover procedure.~~

MSC-B notifies MSC-A or 3G_MSC-A of successful intra -MSC-B handover completion by using the A_HANDOVER_PERFORMED message.

In the Inter-MSC handover case, the role of MSC-B (MSC-B') is only to provide radio resources control within its area. This means that MSC-B keeps control of the radio resources connection and release towards BSS-B. MSC-B will do some processing on the BSSMAP information received on the E-interface or A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards MSC-B, while MSC-B controls them towards its BSSs to the extent that MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between MSC-B and BSS-B is under the responsibility of MSC-B and BSS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from BSS-B, MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with BSS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by MSC-B for the circuit connection with MSC-A then MSC-B shall release the circuit connection.

In the Inter-system Inter-MSC handover case, the role of MSC-B (MSC-B') is only to provide radio resources control within its area. This means that MSC-B keeps control of the radio resources connection and release towards BSS-B. MSC-B will do some processing on the BSSMAP information received on the E-interface or A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards MSC-B, while MSC-B controls them towards its BSSs to the extent that MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between MSC-B and BSS-B is under the responsibility of MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by MSC-B for the circuit connection with 3G_MSC-A then MSC-B shall release the circuit connection.

Modified section

4.4 3G_MSC-B

For roles and functional composition of the 3G_MSC-B working as pure GSM MSC, please see previous clause ("MSC-B").

4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure. 3G_MSC-B notifies MSC-A or 3G_MSC-A of intra-3G_MSC-B InterSystem handover by using the A_HANDOVER_PERFORMED procedure.

The role of 3G_MSC-B is also to provide transcoder resources.

In the Inter-3G_MSC relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the RANAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system UMTS to GSM Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards BSS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the BSSMAP information received on the A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its BSSs to the extent that 3G_MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between 3G_MSC-B and BSS-B is under the responsibility of 3G_MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system GSM to UMTS Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

If 3G_MSC-B does not support the optional supplementary service Mutlicall (See TS 23.135) and 3G_MSC-A requests to relocate multiple bearers, 3G_MSC-B shall indicate that it does not support multiple bearers to 3G_MSC-A.

If 3G_MSC-B supports the optional supplementary service Multicall (See TS 23.135) and UE is engaged with multiple bearers the following description applies;

- In the basic relocation case, the 3G_MSC-B shall be able to allocate an Handover Number for each bearer. The 3G-MSC-B shall also be able to select some bearers so that the number of bearers will fulfill the maximum number of bearers supported by the 3G_MSC-B.

- In the Intra-3G_MSC relocation case, the 3G-MSC-B tries to relocate all bearers to a new RNS.

- In the subsequent relocation back to the 3G_MSC-A or to a third 3G_MSC-B' case, the 3G-MSC-B tries to request to the 3G_MSC-A to relocate all bearers to the 3G_MSC-A or to the 3G_MSC-B'.
- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the subsequent inter-system UMTS to GSM handover back to the 3G_MSC-A or to a third MSC-B' case, the 3G_MSC-B shall be able to select one bearer to be handed over according to the priority level defined as RAB parameters in TS 25.413 and tries to handover the selected bearer.

3GPP TSG-CN1 Meeting #14 ***Tdoc N1-001395***
Cardiff, Wales - 20 - 24 November, 2000

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **317** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X**

Title:	⌘	Correction on TFT setting condition
Source:	⌘	Fujitsu limited
Work item code:	⌘	UMTS/GSM interworking
Date:	⌘	23/Nov/2000
Category:	⌘	**A** Critical correction
Release:	⌘	REL-4

Use one 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 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:	⌘	According to 23.060, even a PDP context without linked PDP context (i.e., it is an only PDP context established to an APN using a same PDP address) can have the TFT, but it is not allowed in 24.008. This modification is to align stage 3 with stage 2.
Summary of change:	⌘	PDP context without linked PDP context shall be able to have TFT.
Consequences if not approved:	⌘	TFT cannot be added to a stand-alone PDP context, and it causes inconsistency between stage 2 (23.060) and stage 3 (24.008).

Clauses affected:	⌘	9.5.10.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

9.5.10 Modify PDP context request (MS to network direction)

This message is sent by the MS to the network to request modification of an active PDP context. See table 9.5.10/TS 24.008.

Message type: MODIFY PDP CONTEXT REQUEST (MS TO NETWORK DIRECTION)

Significance: global

Direction: MS to network

Table 9.5.10/TS 24.008: modify PDP context request (MS to network direction) message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2– 3/2
	Modify PDP context request message identity	Message type 10.4	M	V	1
32	Requested LLC SAPI	LLC service access point identifier 10.5.6.9	O	TV	2
30	Requested new QoS	Quality of service 10.5.6.5	O	TLV	13
31	New TFT	Traffic Flow Template 10.5.6.12	O	TLV	257

9.5.10.1 Requested LLC SAPI

This IE may be included in the message to request a new LLC SAPI if a new QoS is requested.

9.5.10.2 Requested new QoS

This IE may be included in the message to request a modification of the QoS.

9.5.10.3 New TFT

This IE may be~~is~~ included in the message ~~only when multiple PDP contexts with the same PDP address and APN are active,~~ to request a new TFT or modification of ~~the~~ an existing TFT.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001403
(revised from N1-001323)

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **021** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	UMTS to GSM Handover: Directed Retry
Source:	⌘	Nortel Networks
Work item code:	⌘	GSM-UMTS interworking
Date:	⌘	2000-11-23
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	Directed retry in the case of inter-system handover and SRNS relocation is marked as FFS. In GSM, all procedures to execute directed retry are already defined. This contribution adds the text to clarify directed retry for inter-system handover from UMTS to GSM. Directed retry for SRNS relocation is FFS.
Summary of change:	⌘	Text has been added to clarify Directed Retry in case of UMTS to GSM Handover.
Consequences if not approved:	⌘	No description of the complete Directed Retry procedures in the 23.009.

Clauses affected:	⌘	New Clause 14.X		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	-
Other comments:	⌘			

14 Directed retry handover

[Directed retry in the cases of ~~inter system handover and~~ SRNS relocation is FFS]

14.1 GSM handover

The directed retry procedure allows the network to select the optimum cell for the Mobile Station. The process of directed retry involves the assignment of a Mobile Station to a radio channel on a cell other than the serving cell. This process is triggered by the assignment procedures, as described in GSM 08.08 [5], and employs internal or external handover procedures as described in clauses 6 and 7. The successful procedure for a directed retry is as shown in figure 40 and as described below.

If during the assignment phase, as represented by the A-ASSIGNMENT-REQUEST message, a handover becomes necessary, due to either radio conditions or congestion, then the Mobile Station may be handed over to a different cell. When the decision has been made to handover the MS the BSS-A may send an A-ASSIGNMENT-FAILURE message, indicating 'directed retry', before sending the A-HANDOVER-REQUIRED message to MSC-A, indicating 'directed retry'. However BSS-A may alternatively send the A-HANDOVER-REQUIRED message, indicating 'directed retry', without sending the A-ASSIGNMENT-FAILURE message. Other cause values may be used instead of "Directed Retry" in the A-HANDOVER-REQUIRED message, this will allow the MSC to take different actions dependent on the received cause. Upon receipt of the A-HANDOVER-REQUIRED message from BSS-A, then MSC-A shall initiate the handover as described in clauses 6 and 7. No resources shall be cleared in the MSC-A or BSS-A for this connection.

After receipt of the A-HANDOVER-COMPLETE message from BSS-B the assignment procedure shall be considered to be complete and the resources on BSS-A shall be cleared.

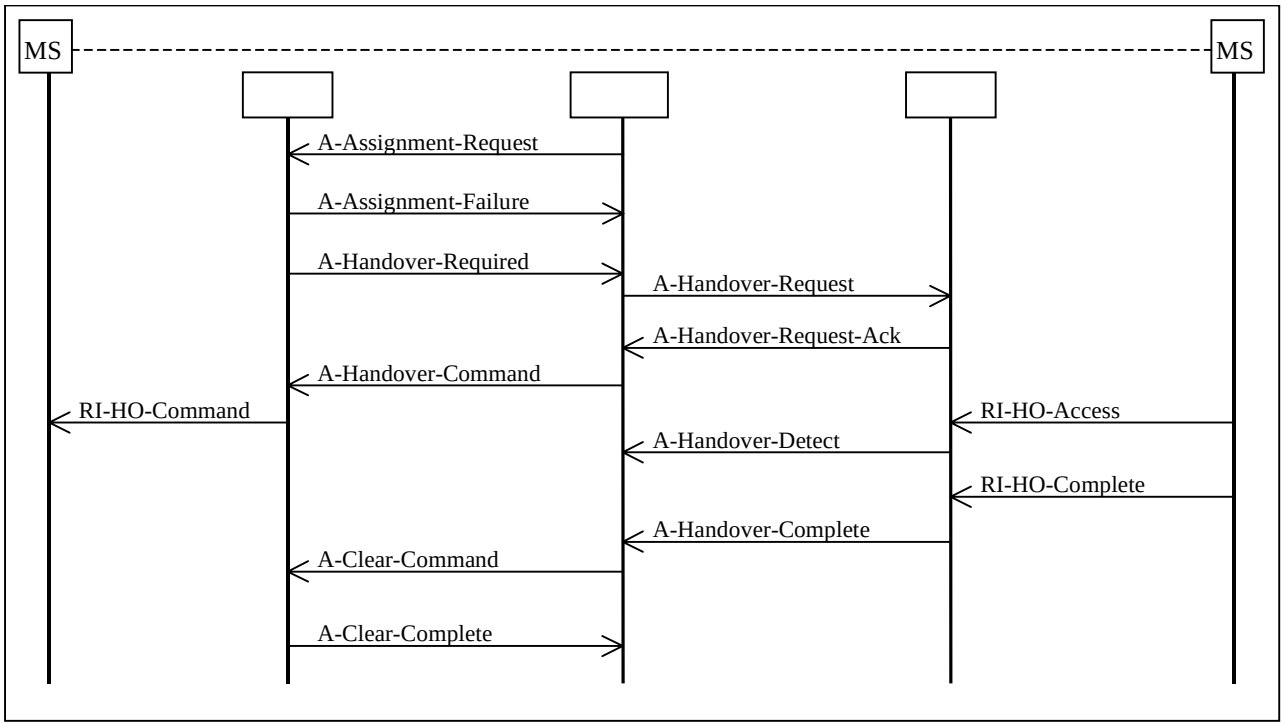

Figure 40: Example of a Directed Retry Intra-MSC Handover Procedure

If a failure occurs during the handover attempt, for example A-HANDOVER-FAILURE returned from BSS-A or BSS-B, then MSC-A will terminate the handover to BSS-B. Under these conditions MSC-A may optionally take one of a number of actions:

i) retry the handover to the same cell;

ii) select the next cell from the list contained in the A-HANDOVER-REQUIRED message and attempt a handover to the new cell;

iii) send an A-HANDOVER-REQUIRED-REJECT to BSS-A, if an A-HANDOVER-COMMAND has not already been sent;

iv) retry the assignment procedure to BSS-A, if the failure message was returned from BSS-A. This option is additional to those for normal handover;

v) Clear the complete call.

The procedures for Inter-MSC handover are also applicable to the directed retry process. If an Inter-MSC handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the A-HO-COMPLETE included in the MAP-SEND-END-SIGNAL request.

14.x UMTS to GSM handover

The directed retry procedure allows the network to select the optimum cell for the UE/MS. The process of directed retry involves the assignment of a UE/MS to a radio channel on a cell other than the serving cell. This process is triggered by the assignment procedures, as described in ~~GSM 08.08~~TS 25.413 [~~15~~], and employs ~~internal or external~~ UMTS to GSM handover procedures as described in clauses 6.2.1 and 8.1. The successful procedure for a directed retry in case of an intra-3G_MSC UMTS to GSM handover is as shown in figure XX and as described below.

If during the assignment phase, as represented by the Iu-RAB-ASSIGNMENT-REQUEST message, a UMTS to GSM handover becomes necessary, due to either radio conditions or congestion, then the UE/MS may be handed over to a GSM cell. When the decision has been made to handover the UE/MS the RNS-A may send an Iu-RAB-ASSIGNMENT-RESPONSE message, indicating 'directed retry', before sending the Iu-RELOCATION-REQUIRED message to 3G_MSC-A, indicating 'directed retry'. However RNS-A may alternatively send the Iu-RELOCATION-REQUIRED message, indicating 'directed retry', without sending the Iu-RAB-ASSIGNMENT-RESPONSE message. Other cause values may be used instead of "Directed Retry" in the Iu-RELOCATION-REQUIRED message, this will allow the 3G_MSC to take different actions dependent on the received cause. Upon receipt of the Iu-RELOCATION-REQUIRED message from RNS-A, then 3G_MSC-A shall initiate the UMTS to GSM handover as described in clauses 6.2.1 and 8.1. No resources shall be cleared in the 3G_MSC-A or RNS-A for this connection.

After receipt of the A-HANDOVER-COMPLETE message from BSS-B the assignment procedure shall be considered to be complete and the resources on RNS-A shall be cleared.

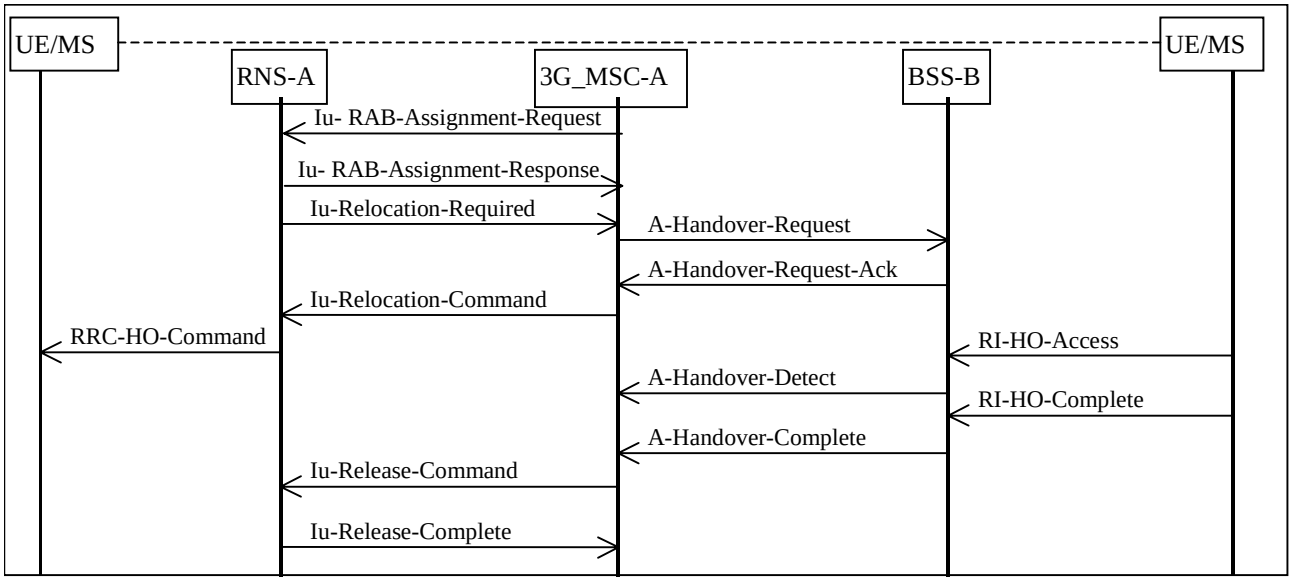

Figure XX: Example of a Directed Retry Intra-3G_MSC UMTS to GSM Handover Procedure

If a failure occurs during the handover attempt, for example Iu-RELOCATION FAILURE returned from RNS-A or A-HANDOVER-FAILURE from BSS-B then 3G_MSC-A will terminate the UMTS to GSM handover to BSS-B. Under these conditions 3G_MSC-A may optionally take one of a number of actions:

i) send an Iu-RELOCATION-PREPARATION FAILURE to RNS-A, if an Iu-RELOCATION-COMMAND has not already been sent;

ii) retry the assignment procedure to RNS-A, if the failure message was returned from RNS-A. This option is additional to those for normal handover;

iii) Clear the complete call.

The procedures for Inter-3G_MSC UMTS to GSM handover are also applicable to the directed retry process. If an Inter-3G_MSC UMTS to GSM handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the ~~Iu-RELOCATION~~A-HO-COMPLETE included in the MAP-SEND-END-SIGNAL request.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001404

Revision of Tdoc N1-001353

Revision of Tdoc N1-001251

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **285** ⌘ rev **2** ⌘ Current version: **3.5.0** ⌘

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

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

Title:	⌘	Removal of "recently deactivated" condition for PDP contexts and some references corrections
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS interworking
Date:	⌘	24/11/00
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:	⌘	The sentence "[recently] deactivated" is too general and no consistent with any description of PDP contexts deactivated Some references to other 3G specs were missing
Summary of change:	⌘	Removal of "recently deactivated" condition for PDP contexts and some references corrections
Consequences if not approved:	⌘	The sentence "[recently] deactivated" is ambiguous The references are necessary

Clauses affected:	⌘	1, 8.3.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ 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.

1 Scope

This TS specifies the procedures used at the radio interface core network protocols within the 3rd generation mobile telecommunications system and the digital cellular telecommunications system.

It specifies the procedures used at the radio interface (Reference Point Um or Uu, see TS 24.002 or 3GPP TS 23.002) for Call Control (CC), Mobility Management (MM), and Session Management (SM).

When the notations for "further study" or "FS" or "FFS" are present in this TS they mean that the indicated text is not a normative portion of this standard.

These procedures are defined in terms of messages exchanged over the control channels of the radio interface. The control channels are described in GSM 04.03 and 3GPP TS 25.301.

The structured functions and procedures of this protocol and the relationship with other layers and entities are described in general terms in TS 24.007.

1.1 Scope of the Technical Specification

The procedures currently described in this TS are for the call control of circuit-switched connections, session management for GPRS services, mobility management and radio resource management for circuit-switched and GPRS services.

TS 24.010 contains functional procedures for support of supplementary services.

~~GSM 04.11~~ 3GPP TS 24.011 contains functional procedures for support of point-to-point short message services.

~~GSM 04.12~~ 3GPP TS 24.012 contains functional description of short message - cell broadcast.

GSM 04.60 contains procedures for radio link control and medium access control (RLC/MAC) of packet data physical channels.

TS 24.071 contains functional descriptions and procedures for support of location services.

NOTE: "layer 3" includes the functions and protocols described in this Technical Specification. The terms "data link layer" and "layer 2" are used interchangeably to refer to the layer immediately below layer 3.

1.2 Application to the interface structures

The ~~layer 3~~ procedures defined in this document apply to the interface structures defined in GSM 04.03 and 3GPP TS 25.301. They use the functions and services provided by lower layers ~~2~~ defined in GSM 04.05 and GSM 04.06 or 3GPP TS 25.331, 3GPP TS 25.322 and 3GPP TS 25.321. TS 24.007 gives the general description of layer 3 (A/Gb mode) and Non Access Stratum (Iu mode) including procedures, messages format and error handling.

1.5 Use of logical channels in A/Gb mode

The logical control channels are defined in GSM 05.02. In the following those control channels are considered which carry signalling information or specific types of user packet information:

i) Broadcast Control CHannel (BCCH): downlink only, used to broadcast Cell specific information;

ii) Synchronization CHannel (SCH): downlink only, used to broadcast synchronization and BSS identification information;

iii) Paging CHannel (PCH): downlink only, used to send page requests to Mobile Stations (MSs);

iv) Random Access CHannel (RACH): uplink only, used to request a Dedicated Control CHannel;

v) Access Grant CHannel (AGCH): downlink only, used to allocate a Dedicated Control CHannel;

vi) Standalone Dedicated Control CHannel (SDCCH): bi-directional;

vii) Fast Associated Control CHannel (FACCH): bi-directional, associated with a Traffic CHannel;

viii) Slow Associated Control CHannel (SACCH): bi-directional, associated with a SDCCH or a Traffic CHannel;

ix) Cell Broadcast CHannel (CBCH): downlink only used for general (not point to point) short message information.

x) Notification CHannel (NCH): downlink only, used to notify mobile stations of VBS (Voice Broadcast Service) calls or VGCS (Voice Group Call Service) calls.

Two service access points are defined on signalling layer 2 which are discriminated by their Service Access Point Identifiers (SAPI) (see GSM 04.06):

i) SAPI 0: supports the transfer of signalling information including user-user information;

ii) SAPI 3: supports the transfer of user short messages.

Layer 3 selects the service access point, the logical control channel and the mode of operation of layer 2 (acknowledged, unacknowledged or random access, see GSM 04.05 and GSM 04.06) as required for each individual message.

8.3.2 Session Management

The mobile station and network shall ignore a session management message with TI EXT bit = 0. Otherwise, the following procedures shall apply:

a) Whenever any session management message except ACTIVATE PDP CONTEXT REQUEST, ACTIVATE SECONDARY PDP CONTEXT REQUEST, or SM-STATUS is received by the network specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation ~~or has been [recently] deactivated~~, the network shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

b) Whenever any session management message except REQUEST PDP CONTEXT ACTIVATION or SM-STATUS is received by the MS specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation ~~or has been [recently] deactivated~~, the MS shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

c) When REQUEST PDP CONTEXT ACTIVATION message is received with a transaction identifier flag set to "1", this message shall be ignored.

d) When an ACTIVATE PDP CONTEXT REQUEST message is received specifying a transaction identifier which is not recognized as relating to a context that is in the process of activation, and with a transaction identifier flag set to "1", this message shall be ignored.

e) Whenever an ACTIVATE PDP CONTEXT REQUEST message is received by the network specifying a transaction identifier relating to a PDP context not in state PDP-INACTIVE, the network shall deactivate the old PDP context relating to the received transaction identifier without notifying the MS. Furthermore, the network shall continue with the activation procedure of a new PDP context as indicated in the received message.

f) Whenever a REQUEST PDP CONTEXT ACTIVATION message is received by the MS specifying a transaction identifier relating to a PDP context not in state PDP-INACTIVE, the MS shall locally deactivate the

old PDP context relating to the received transaction identifier. Furthermore, the MS shall continue with the activation procedure of a new PDP context as indicated in the received message.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001405

Revision of Tdoc N1-001354

Revision of Tdoc N1-001252

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **286** ⌘ rev **2** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Removal of "recently deactivated" condition for PDP contexts and some references corrections
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS interworking ?
Date:	⌘	24/11/00
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
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R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

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Consequences if not approved:	⌘	The sentence "[recently] deactivated" is ambiguous The references are necessary

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	⌘	
Other comments:	⌘	

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b) Whenever any session management message except REQUEST PDP CONTEXT ACTIVATION or SM-STATUS is received by the MS specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation ~~or has been [recently] deactivated~~, the MS shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

c) When REQUEST PDP CONTEXT ACTIVATION message is received with a transaction identifier flag set to "1", this message shall be ignored.

d) When an ACTIVATE PDP CONTEXT REQUEST message is received specifying a transaction identifier which is not recognized as relating to a context that is in the process of activation, and with a transaction identifier flag set to "1", this message shall be ignored.

e) Whenever an ACTIVATE PDP CONTEXT REQUEST message is received by the network specifying a transaction identifier relating to a PDP context not in state PDP-INACTIVE, the network shall deactivate the old PDP context relating to the received transaction identifier without notifying the MS. Furthermore, the network shall continue with the activation procedure of a new PDP context as indicated in the received message.

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3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001408
(revision of N1-001384)
(revision of N1-001348)
(revision of N1-001186)

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **017** ⌘ rev **3** ⌘ Current version: **3.4.0** ⌘

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

Title:	⌘	Missing Subsequent Handover Scenarios
Source:	⌘	Nortel Networks
Work item code:	⌘	GSM-UMTS Interworking
Date:	⌘	11.24.00
Category:	⌘	**F**
Release:	⌘	R99

Use one 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 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:

Eight Subsequent Handover Scenarios are possible (see table below). However, TS 23.009 does not mention anything about two of the scenarios: UMTS-GSM-GSM and GSM-UMTS-UMTS.

The purpose of this CR is to include a description of the two missing scenarios. Text has been added to Section 7.3.2 and 7.4.2 to cover the UMTS-GSM-GSM scenario. Also, text has been added to 8.3.3 and 8.3.4 to state that the GSM-UMTS-UMTS scenario cannot be supported since the anchor MSC is a pure GSM MSC which does not support RANAP.

MSC-A	**MSC-B**	**MSC-B'**	**Reference in 23.009**
GSM	GSM	GSM	Section 7.3.2 Figure 15 Section 7.4.2 Figure 17
UMTS	***GSM***	***GSM***	***New text to Section 7.3.2*** ***New text to Section 7.4.2***
GSM	UMTS	GSM	Section 8.1.3.2 Figure 21 Section 8.1.4.2 Figure 23
UMTS	UMTS	GSM	Section 8.1.3.2 Figure 21 Section 8.1.4.2 Figure 23
GSM	GSM	UMTS	Section 8.2.3.2 Figure 27 Section 8.2.4.2 Figure 29
UMTS	GSM	UMTS	Section 8.2.3.2 Figure 27 Section 8.2.4.2 Figure 29
GSM	***UMTS***	***UMTS***	***New text to Section 8.3.3*** ***New text to Section 8.3.4***
UMTS	UMTS	UMTS	Section 8.3.3.2 Figure 33 Section 8.3.4.2 Figure 35

It is essential that these scenarios are included in the specification in order to reduce any ambiguity in interpretations.

Summary of change: ⌘ Include description of the two missing Subsequent Handover scenarios.

Consequences if not approved:	⌘	It is essential that all possible Subsequent Handover scenarios are mentioned in order to reduce any ambiguity in interpretations.

Clauses affected:	⌘	7.3, 7.3.2, 7.4, 7.4.2, 8.1.3, 8.1.4, 8.2.3, 8.2.4, 8.3.3, 8.3.4		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

3G TS 23.009 V3.4.0 (2000-09)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Core Network; Handover procedures (Release 1999)

7.3 Procedure for subsequent handover requiring a circuit connection ~~between MSC-A and MSC-B~~

After the call has been handed over ~~from MSC-A~~ to MSC-B, if the MS leaves the area of MSC-B during the same call, subsequent handover is necessary in order to continue the connection.

The following cases apply:

i) the MS moves back to the area of MSC-A;

ii) the MS moves into the area of a third MSC (MSC-B').

In both cases the call is switched in MSC-A; the circuit between MSC-A and MSC-B shall be released after a successful subsequent handover has been performed.

7.3.1 Description of subsequent handover procedure i): MSC-B to MSC-A

The procedure for successful handover from MSC-B back to MSC-A is shown in figure 14.

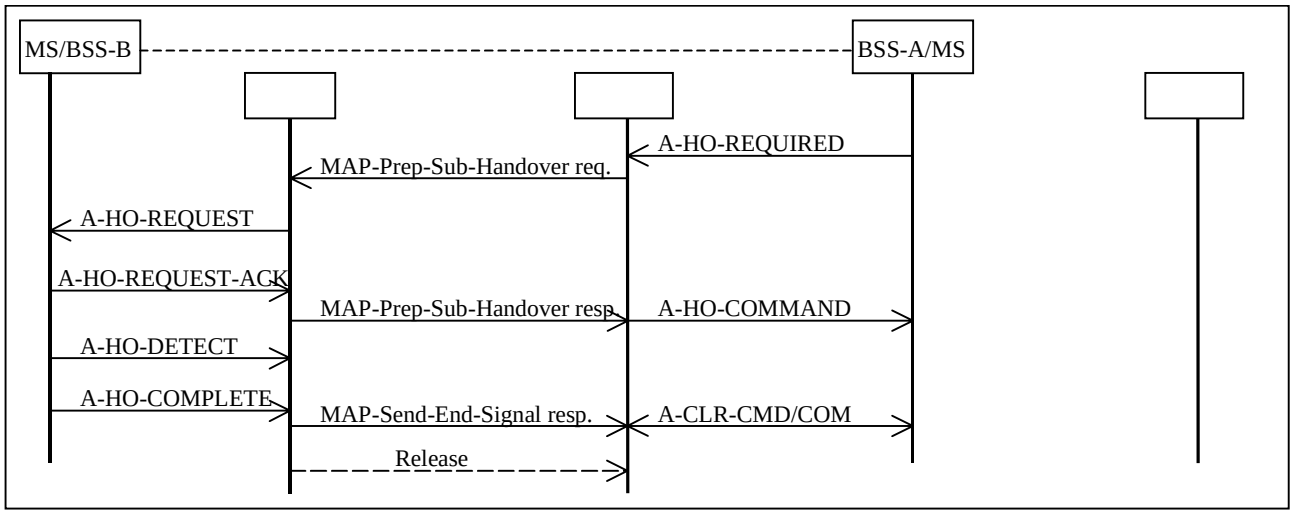

Figure 14: Subsequent handover procedure i):successful handover from MSC-B to MSC-A using a circuit connection

The procedure is as follows.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating the new MSC number(MSC-A number), indicating also the identity of the cell where the call has to be handed over and including a complete A-HO-REQUEST message. (NOTE: MSC-B shall not send further MAP-PREPARE-SUBSEQUENT-HANDOVER requests while a handover attempt is pending or before any timeouts). Since MSC-A is the call controlling MSC, this MSC needs no Handover Number for routing purposes; MSC-A can immediately initiate the search for a free radio channel.

When a radio channel can be assigned, MSC-A shall return in the MAP-PREPARE-SUBSEQUENT-HANDOVER response the complete A-HO-REQUEST-ACKNOWLEDGE message received from the BSS-B and possible extra BSSMAP information, amended by MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface and the BSSMAP protocol used on the A-interface. If the traffic channel allocation is queued by BSS-B, the A-QUEUING-INDICATION may optionaly be sent back to MSC-B. The further traffic channel allocation result (A-HO-REQUEST-ACK or A-HO-FAILURE) will be transferred to MSC-B using the MAP-FORWARD-ACCESS-SIGNALLING request.If a radio channel cannot be assigned or if a fault is detected on the target cell identity, or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing an A-HO-FAILURE message shall be given to MSC-B, in addition MSC-B shall maintain the connection with the MS.

If the procedure in MSC-A is successful then MSC-B can request the MS to retune to the new BSS-B on MSC-A. This is illustrated in figure 14 by the A-HO-COMMAND message. The operation is successfully completed when MSC-A receives the A-HO-COMPLETE message.

After handover MSC-A shall release the circuit to MSC-B.

MSC-A must also terminate the MAP procedure for the basic handover between MSC-A and MSC-B by sending an appropriate MAP message. MSC-B will clear the resources in BSS-A when the MAP-SEND-END-SIGNAL response is received.

7.3.2 Description of the subsequent handover procedure ii): MSC-B to MSC-B'

The procedure for successful handover from MSC-B to MSC-B' is shown in figure 15.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.3.1 (the same procedures apply if MSC-A is replaced by 3G_MSC-A); and

- a basic handover from MSC-A to MSC-B' as described in subclause 7.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of MSC-B'), indicating also the target cell identity and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards MSC-B'.

When MSC-A receives the ACM from MSC-B', MSC-A informs MSC-B that MSC-B' has successfuly allocated the radio resources on BSS-B' side by sending the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing the complete A-HO-REQUEST-ACKNOWLEDGE received from BSS-B'and possible extra BSSMAP information, amended by MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B' and the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B. Now MSC-B can start the procedure on the radio path.

For MSC-A the handover is completed when it has received the MAP-SEND-END-SIGNAL REQUEST from MSC-B'containing the A-HO-COMPLETE received from the BSS-B'. The circuit between MSC-A and MSC-B is released. MSC-A also sends the MAP-SEND-END-SIGNAL response to MSC-B in order to terminate the original MAP dialogue between MSC-A and MSC-B. MSC-B releases the radio resources when it receives this message.

If the traffic channel allocation is queued by the BSS-B', the A-QUEUING-INDICATION may optionaly be sent back to MSC-B. If no radio channel can be allocated by MSC-B' or no circuit between MSC-A and MSC-B' can be established or a fault is detected on the target cell identity or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, MSC-A informs MSC-B by using the A-HO-FAILURE message included in the MAP-PREPARE-SUBSEQUENT-HANDOVER response. MSC-B shall maintain the existing connection with the MS.

When the subsequent handover is completed, MSC-B' is considered as MSC-B. Any further inter-MSC handover is handled as described above for a subsequent handover.

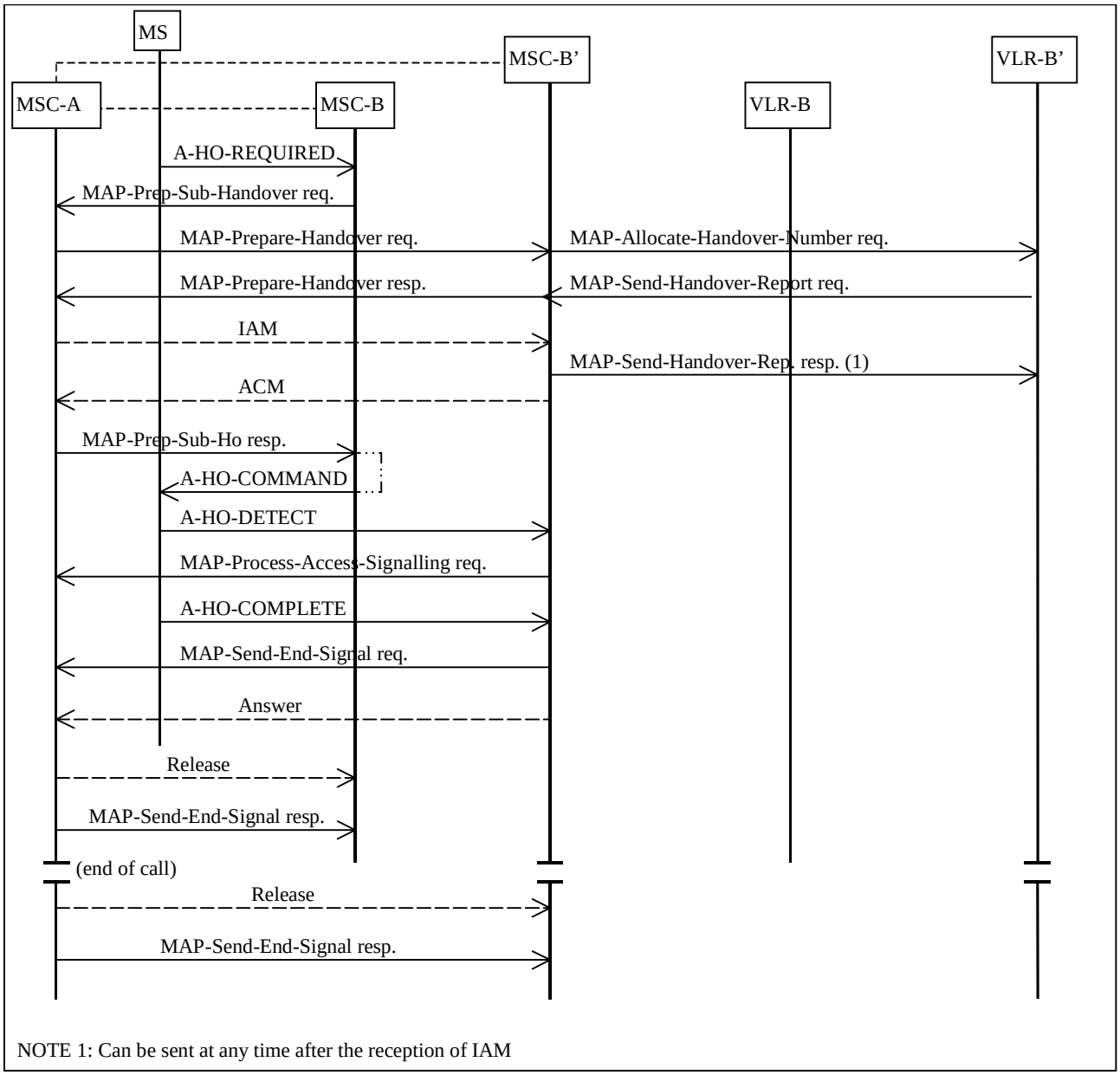

Figure 15: Subsequent handover procedure ii): Successful handover from MSC-B to MSC-B' requiring a circuit connection

7.4 Procedure for subsequent handover not requiring a circuit connection ~~between MSC-A and MSC-B~~

As for the subsequent handover with a circuit connection ~~between MSC-A and MSC-B~~, the same two cases of subsequent handover apply:

i) the MS moves back to the area of MSC-A;

ii) the MS moves into the area of a third MSC (MSC-B').

7.4.1 Description of the subsequent handover procedure without circuit connection i): MSC-B to MSC-A

The procedure for successful handover from MSC-B back to MSC-A without circuit connection is shown in figure 16. The only difference with the figure 14, is that no circuit release is needed between MSC-A and MSC-B.

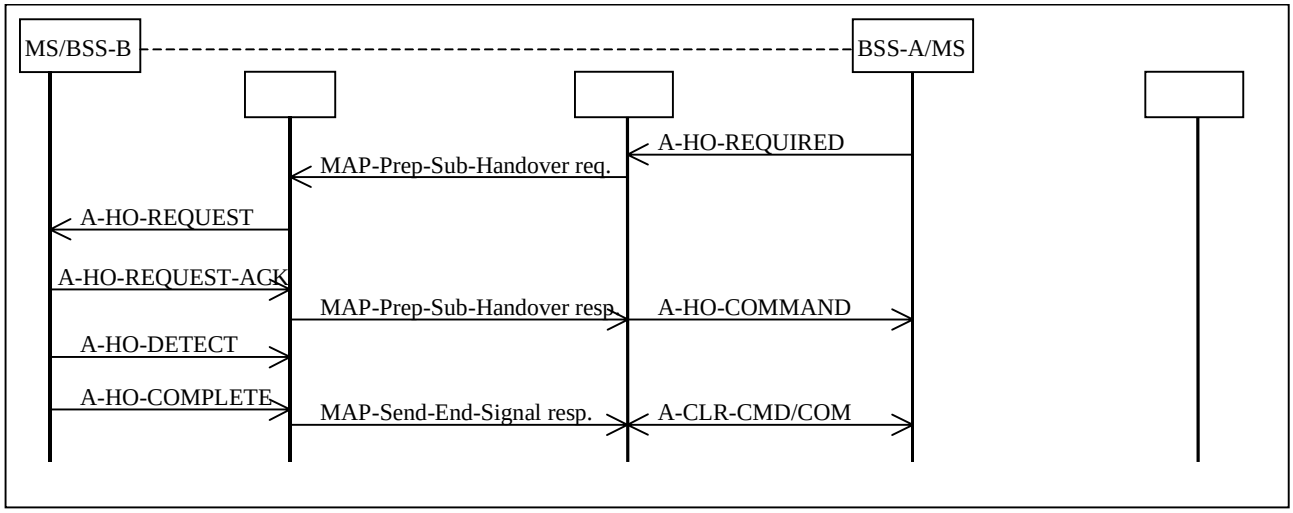

Figure 16: Subsequent handover procedure i): Successful handover from MSC-B to MSC-A not requiring a circuit connection

7.4.2 Description of the subsequent handover procedure without circuit connection ii): MSC-B to MSC-B'

The procedure for successful handover from MSC-B to MSC-B' is shown in figure 17.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.4.1(the same procedures apply if MSC-A is replaced by 3G_MSC-A); and
- a basic handover from MSC-A to MSC-B' as described in subclause 7.2.

The only difference to the equivalent figure 15 is the omission of the circuit and handover number allocation signallings.

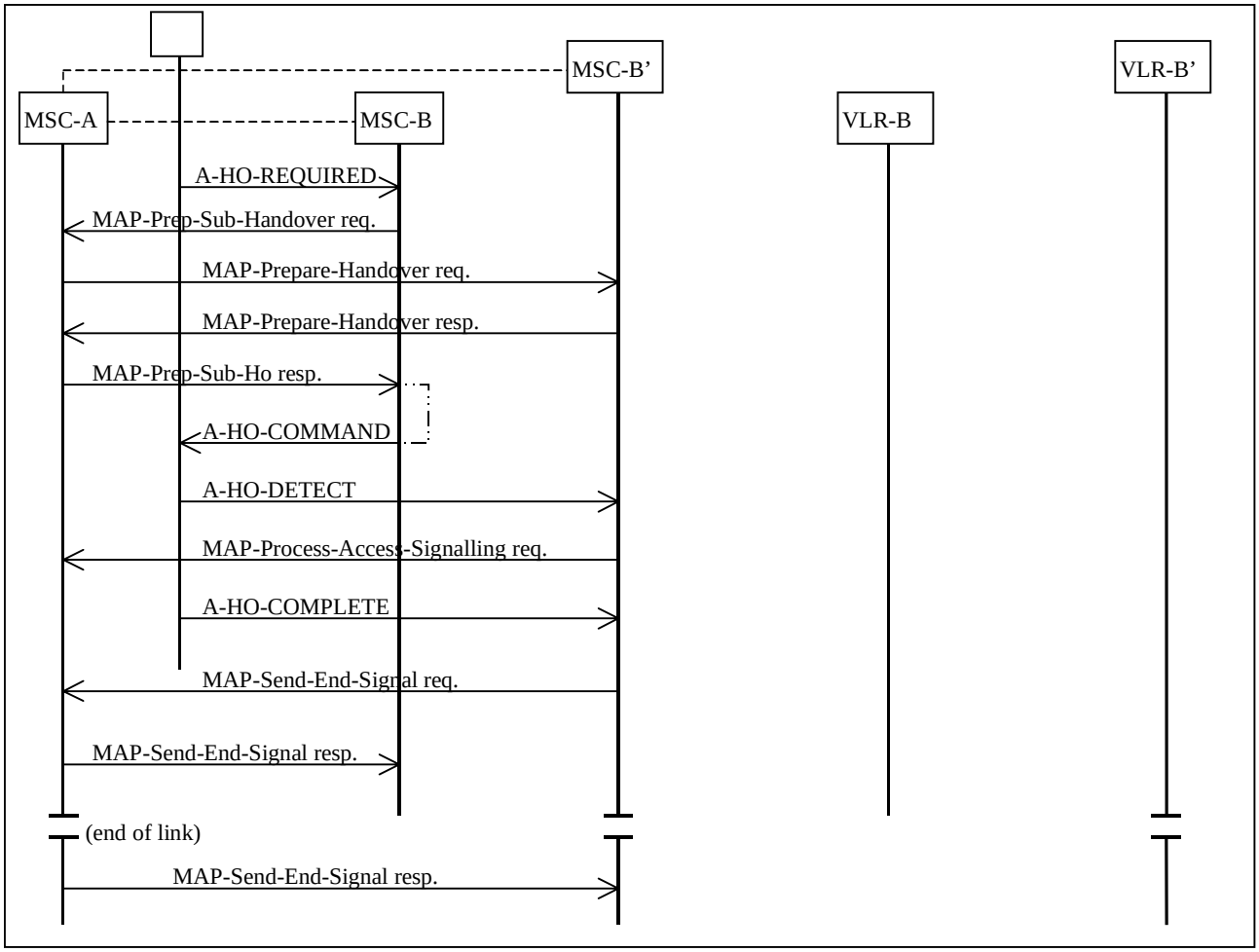

Figure 17: Subsequent handover procedure ii): Successful handover from MSC-B to MSC-B' without circuit connection

*** NEXT MODIFIED SECTION ***

8.1.3 Procedure for subsequent UMTS to GSM handover requiring a circuit connection ~~between 3G_MSC-A and 3G_MSC-B~~

After the call has been handed over ~~from 3G_MSC-A~~ to 3G_MSC-B, if the UE/MS leaves the area of 3G_MSC-B during the same call and enters a GSM area, subsequent UMTS to GSM handover is necessary in order to continue the connection.

The following cases apply:

i) the UE/MS moves back to the area of MSC-A;

ii) the UE/MS moves into the area of a third MSC (MSC-B').

In both cases the call is switched in 3G_MSC-A; the circuit between 3G_MSC-A and MSC-B shall be released after a successful subsequent handover has been performed ~~(remember that 3G_MSC-A can be a pure GSM MSC~~ the same procedures apply if 3G_MSC-A is replaced by MSC-A)~~)~~.

8.1.3.1 Description of subsequent UMTS to GSM handover procedure i): 3G_MSC-B to MSC-A

The procedure for successful UMTS to GSM handover from MSC-B back to 3G_MSC-A is shown in figure 20.

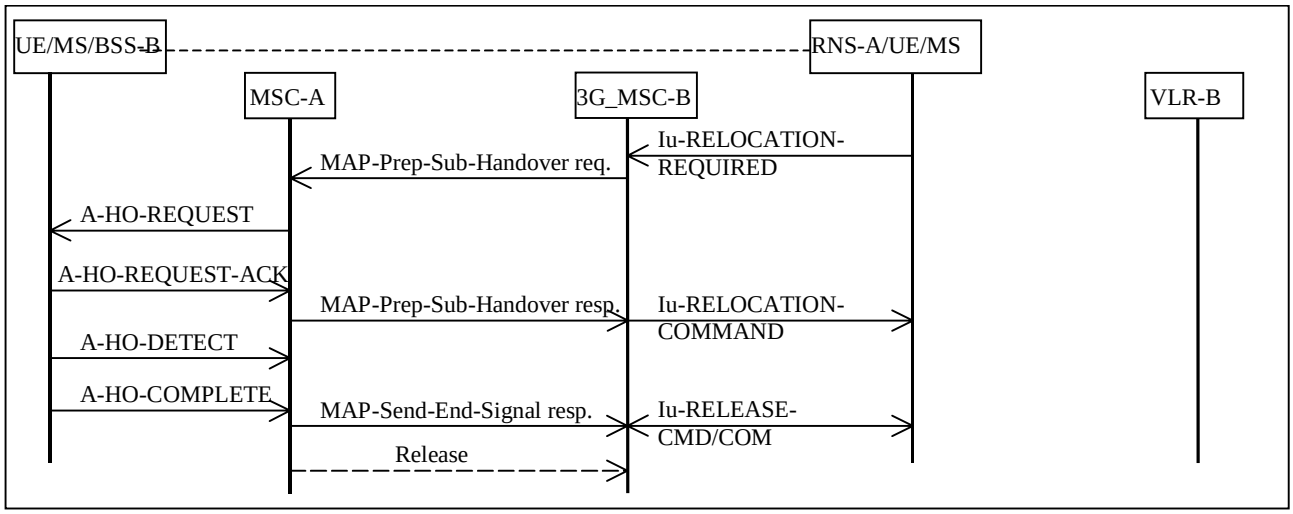

Figure 20: Subsequent UMTS to GSM handover procedure i): successful UMTS to GSM handover from 3G_MSC-B to MSC-A using a circuit connection

8.1.3.1.1 With one circuit connection

8.1.3.1.2 With multiple circuit connections (Optional functionality)

8.1.3.2 Description of subsequent UMTS to GSM handover procedure ii): 3G_MSC-B to MSC-B'

The procedure for successful UMTS to GSM handover from 3G_MSC-B to MSC-B' is shown in figure 21.

The procedure consists of two parts:

- a subsequent UMTS to GSM handover from 3G_MSC-B back to 3G_MSC-A as described in subclause 8.1.3.1 (the same procedures apply if 3G_MSC-A is replaced by MSC-A~~3G_MSC-A can also be a pure GSM MSC, the procedure is the same in both casess~~); and

- a basic handover from 3G_MSC-A to MSC-B' as described in subclause 7.1.

8.1.3.2.1 With one circuit connection

8.1.3.2.2 With multiple circuit connections (Optional functionality)

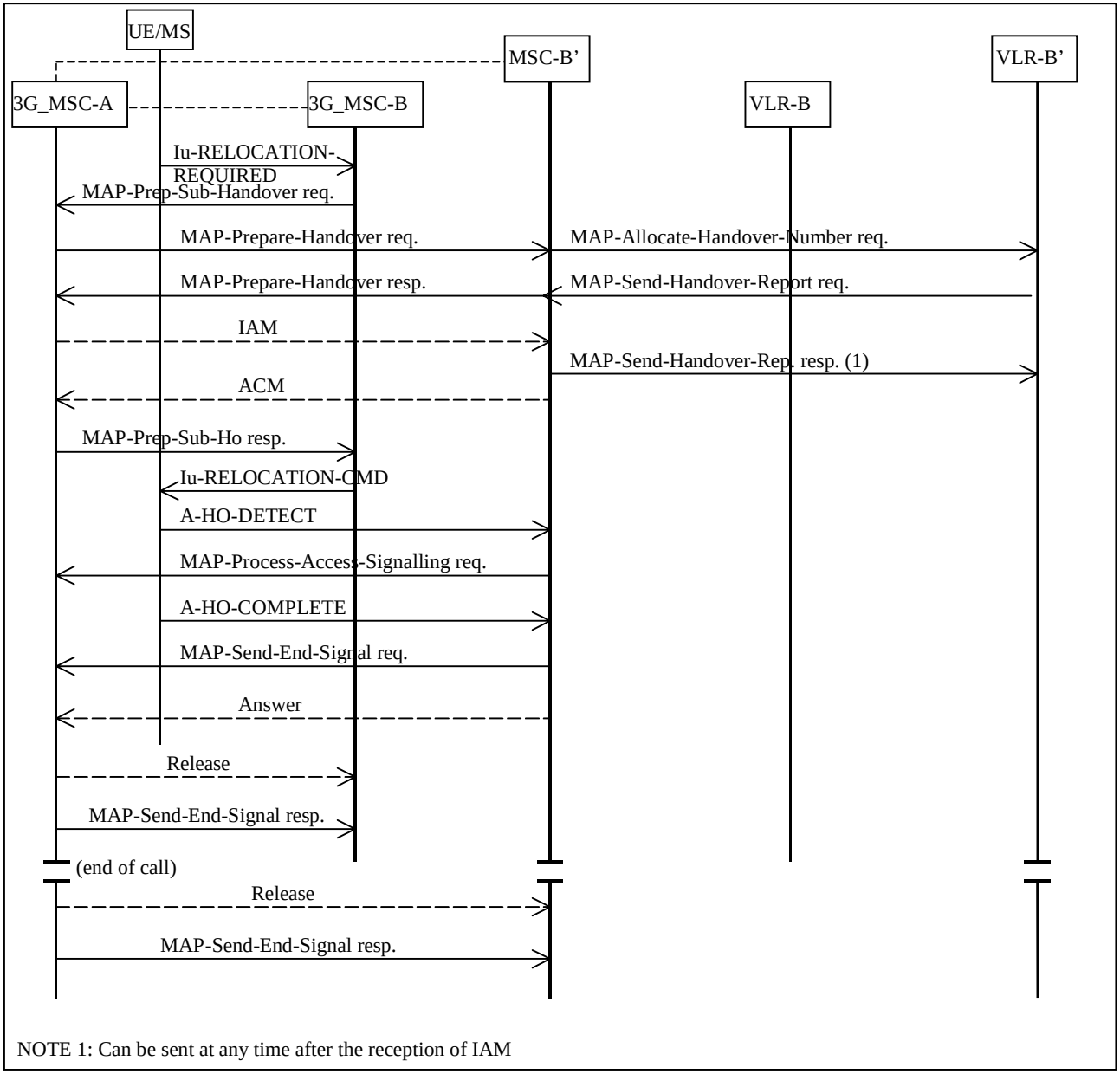

Figure 21: Subsequent handover procedure ii): Successful UMTS to GSM handover from 3G_MSC-B to MSC-B' requiring a circuit connection

8.1.4 Procedure for subsequent UMTS to GSM handover not requiring a circuit connection ~~between 3G_MSC-A and 3G_MSC-B~~

As for the subsequent UMTS to GSM handover with a circuit connection ~~between 3G_MSC-A and 3G_MSC-B~~, the same two cases of subsequent handover apply:

i) the UE/MS moves back to the area of MSC-A;

ii) the UE/MS moves into the area of a third MSC (MSC-B').

8.1.4.1 Description of subsequent UMTS to GSM handover procedure i): 3G_MSC-B to MSC-A

The procedure for successful UMTS to GSM handover from 3G_MSC-B back to MSC-A without circuit connection is shown in figure 22. The only difference with the figure 20, is that no circuit release is needed between MSC-A and 3G_MSC-B.

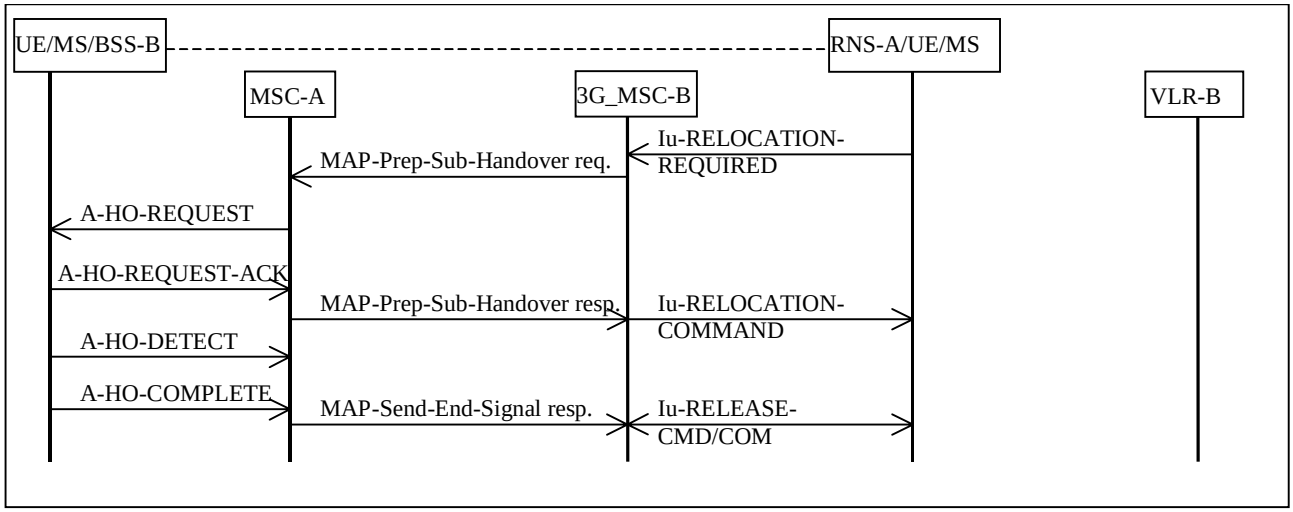

Figure 22: Subsequent UMTS to GSM handover procedure i): Successful UMTS to GSM handover from 3G_MSC-B to MSC-A not requiring a circuit connection

8.1.4.2 Description of the subsequent UMTS to GSM handover procedure without circuit connection ii): 3G_MSC-B to MSC-B'

The procedure for successful UMTS to GSM handover from 3G_MSC-B to MSC-B' is shown in figure 23.

The procedure consists of two parts:

- a subsequent UMTS to GSM handover from 3G_MSC-B back to 3G_MSC-A as described in subclause 8.1.4.1 (the same procedures apply if 3G_MSC-A is replaced by MSC-A~~3G_MSC-A can also be a pure GSM MSC, the procedure is the same in both casess~~); and

- a basic handover from 3G_MSC-A to MSC-B' as described in subclause 7.2.

The only difference to the equivalent figure 21 is the omission of the circuit and handover number allocation signallings.

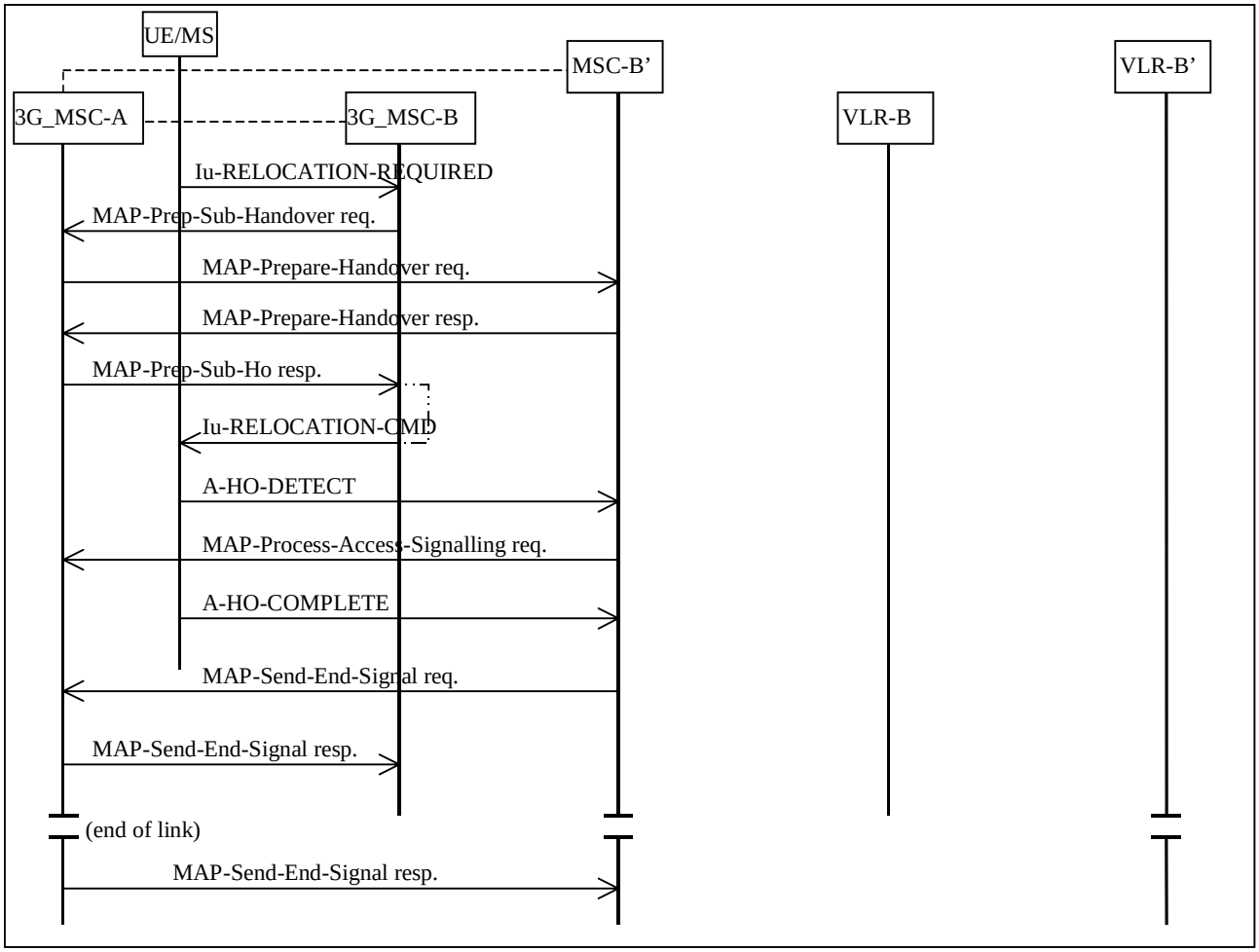

Figure 23: Subsequent UMTS to GSM handover procedure ii): Successful UMTS to GSM handover from 3G_MSC-B to MSC-B' without circuit connection

***** NEXT MODIFIED SECTION *****

8.2.3 Procedure for subsequent GSM to UMTS handover requiring a circuit connection ~~between 3G_MSC-A and MSC-B~~

After the call has been handed over to MSC-B, if the UE/MS leaves the GSM area of MSC-B during the same call and enters a UTRAN area, subsequent GSM to UMTS handover is necessary in order to continue the connection.

The following cases apply:

i) the UE/MS moves back to the area of 3G_MSC-A;

ii) the UE/MS moves into the area of a third 3G_MSC (3G_MSC-B').

In both cases the call is switched in 3G_MSC-A; the circuit between 3G_MSC-A and MSC-B shall be released after a successful subsequent handover has been performed.

8.2.3.1 Description of subsequent GSM to UMTS handover procedure i): MSC-B to 3G_MSC-A

The procedure for successful GSM to UMTS handover from MSC-B back to 3G_MSC-A is shown in figure 26.

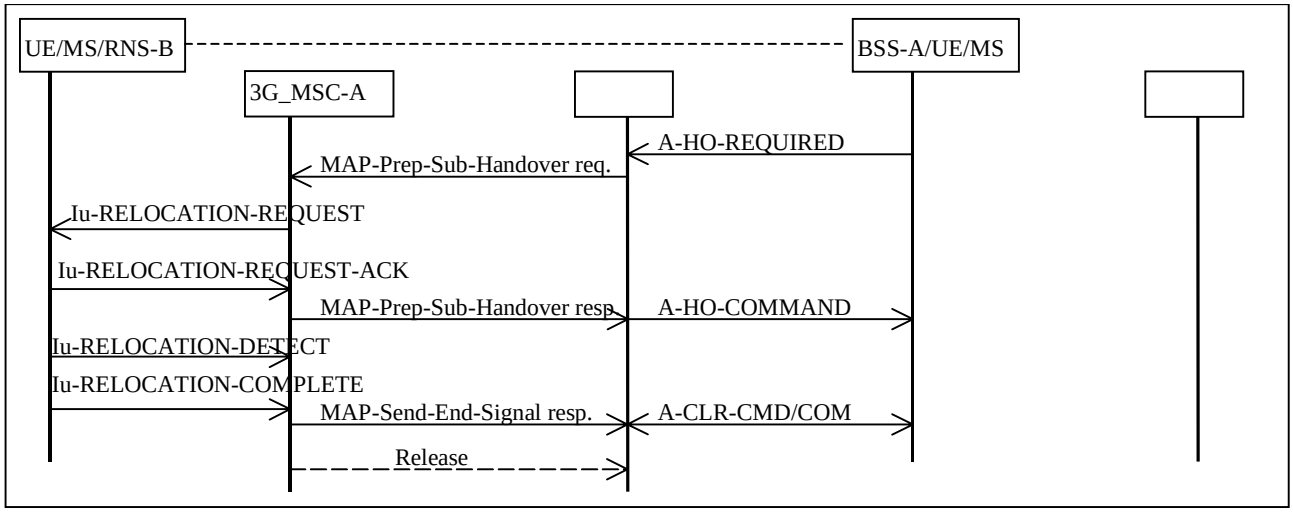

Figure 26: Subsequent GSM to UMTS handover procedure i): successful handover from MSC-B to 3G_MSC-A using a circuit connection

The procedure is as follows.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to 3G_MSC-A indicating the new MSC number (3G_MSC-A number), indicating also the identity of the cell where the call has to be handed over and including a complete A-HO-REQUEST message. (NOTE: MSC-B shall not send further MAP-PREPARE-SUBSEQUENT-HANDOVER requests while a handover attempt is pending or before any timeouts). Since 3G_MSC-A is the call controlling MSC, this MSC needs no Handover Number for routing purposes; 3G_MSC-A can immediately initiate the search for free radio resources. 3G_MSC-A then inserts a transcoder between it's RNS and the connection to the other party.

When radio resources can be assigned, 3G_MSC-A shall return in the MAP-PREPARE-SUBSEQUENT-HANDOVER response the complete A-HO-REQUEST-ACK message generated from the Iu-RELOCATION-REQUEST-ACK received from the RNS-B and possible extra BSSMAP information, amended by 3G_MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface and the RANAP protocol used on the Iu-interface. If radio resources cannot be assigned or if a fault is detected on the target cell identity, or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing an A-HO-FAILURE message shall be given to MSC-B, in addition MSC-B shall maintain the connection with the UE/MS.

If the procedure in 3G_MSC-A is successful then MSC-B can request the UE/MS to retune to the new RNS-B on 3G_MSC-A. This is illustrated in figure 26 by the A-HO-COMMAND message. The operation is successfully completed when 3G_MSC-A receives the Iu-RELOCATION-COMPLETE message.

After GSM to UMTS handover 3G_MSC-A shall release the circuit to MSC-B.

3G_MSC-A must also terminate the MAP procedure for the basic handover between 3G_MSC-A and MSC-B by sending an appropriate MAP message. MSC-B will clear the resources in BSS-A when the MAP-SEND-END-SIGNAL response is received.

8.2.3.2 Description of subsequent GSM to UMTS handover procedure ii): MSC-B to 3G_MSC-B'

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 27.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.3.1 (the same procedures apply if MSC-A is replaced by 3G_MSC-A ~~MSC-A can also be a 3G_MSC, the procedure is the same in both cases~~); and

- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in subclause 8.2.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of 3G_MSC-B'), indicating also the target cell identity and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards 3G_MSC-B'.

When MSC-A receives the ACM from 3G_MSC-B', MSC-A informs MSC-B that 3G_MSC-B' has successfully allocated the radio resources on RNS-B' side by sending the MAP-PREPARE-SUBSEQUENT-HANDOVER response containing the complete A-HO-REQUEST-ACK generated from the RELOCATION-REQUEST-ACK received from RNS-B' and possible extra BSSMAP information, amended by MSC-A due to the possible interworking between the BSSMAP protocol carried on the E-interface between MSC-A and 3G_MSC-B' and the BSSMAP protocol carried on the E-interface between MSC-A and MSC-B. Now MSC-B can start the procedure on the radio path.

For MSC-A the handover is completed when it has received the MAP-SEND-END-SIGNAL REQUEST from 3G_MSC-B' containing the A-HO-COMPLETE generated from Iu-RECOLATION COMPLETE received from the RNS-B'. The circuit between MSC-A and MSC-B is released. MSC-A also sends the MAP-SEND-END-SIGNAL response to MSC-B in order to terminate the original MAP dialogue between MSC-A and MSC-B. MSC-B releases the radio resources when it receives this message.

If no radio resources can be allocated by 3G_MSC-B' or no circuit between MSC-A and 3G_MSC-B' can be established or a fault is detected on the target cell identity or the target cell identity in the A-HO-REQUEST is not consistent with the target MSC number, MSC-A informs MSC-B by using the A-HO-FAILURE message included in the MAP-PREPARE-SUBSEQUENT-HANDOVER response. MSC-B shall maintain the existing connection with the UE/MS.

When the subsequent GSM to UMTS handover is completed, 3G_MSC-B' is considered as 3G_MSC-B. Any further inter-MSC handover is handled as described above for a subsequent handover.

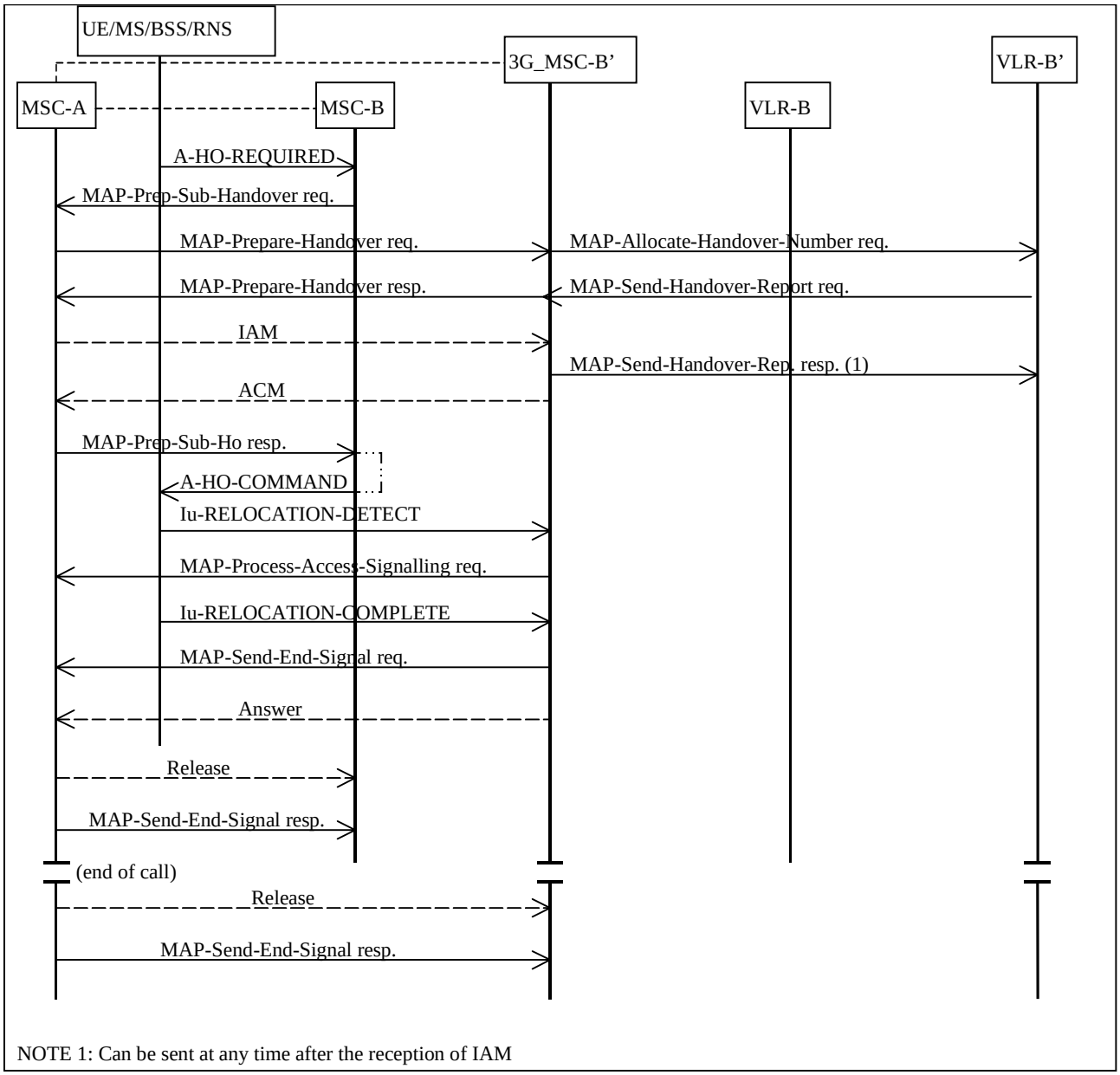

Figure 27: Subsequent GSM to UMTS handover procedure ii): Successful handover from MSC-B to 3G_MSC-B' requiring a circuit connection

8.2.4 Procedure for subsequent GSM to UMTS handover not requiring a circuit connection ~~between 3G_MSC-A and MSC-B~~

As for the subsequent GSM to UMTS handover with a circuit connection ~~between 3G_MSC-A and MSC-B~~, the same two cases of subsequent handover apply:

i) the UE/MS moves back to the area of 3G_MSC-A;

ii) the UE/MS moves into the area of a third 3G_MSC (3G_MSC-B').

8.2.4.1 Description of subsequent GSM to UMTS handover procedure without circuit connection i): MSC-B to 3G_MSC-A

The procedure for successful GSM to UMTS handover from MSC-B back to 3G_MSC-A without circuit connection is shown in figure 28. The only difference with the figure 26, is that no circuit release is needed between 3G_MSC-A and MSC-B.

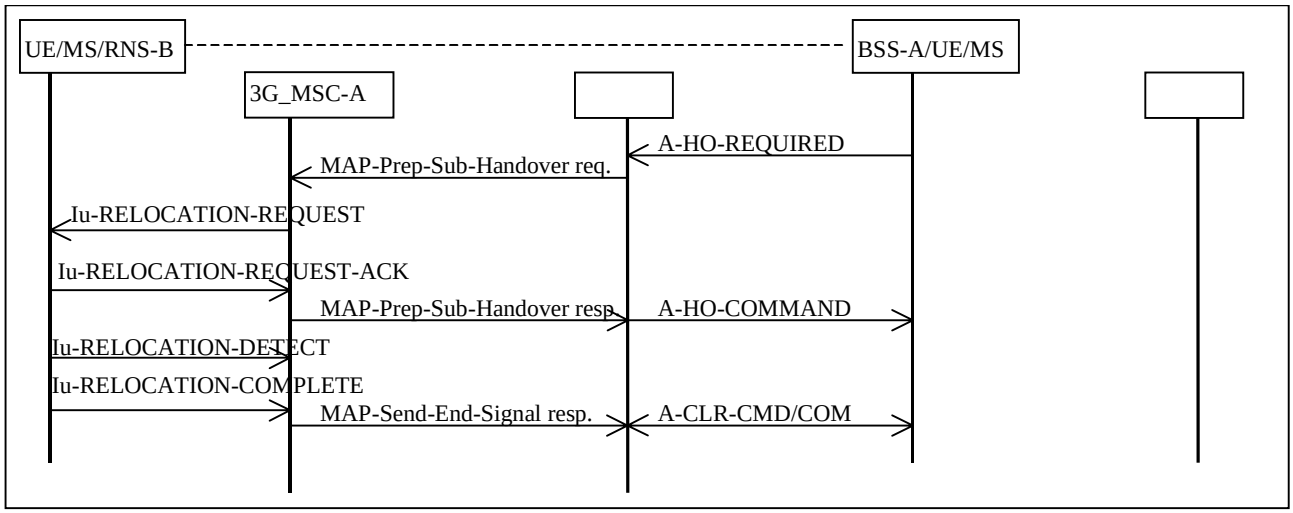

Figure 28: Subsequent GSM to UMTS handover procedure i): Successful handover from MSC-B to 3G_MSC-A not requiring a circuit connection

8.2.4.2 Description of subsequent GSM to UMTS handover procedure without circuit connection ii): MSC-B to 3G_MSC-B'

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 29.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.4.1 (the same procedures apply if MSC-A is replaced by 3G_MSC-A~~MSC-A can also be a 3G_MSC, the procedure is the same in both cases~~); and

- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in subclause 8.2.2.

The only difference to the equivalent figure 27 is the omission of the circuit and handover number allocation signallings.

*** NEXT MODIFIED SECTION ***

8.3.3 Procedure for subsequent relocation requiring a circuit connection ~~between 3G_MSC-A and 3G_MSC-B~~

After the call has been relocated ~~from 3G_MSC-A~~ to 3G_MSC-B, if the UE leaves the area of 3G_MSC-B during the same call, subsequent relocation is necessary in order to continue the connection when no Iur interface exists between the involved RNSs, or to optimise the transmission path when the Iur interface is used.

The following cases apply:

i) the UE moves back to the area of 3G_MSC-A;

ii) the UE moves into the area of a third 3G_MSC (3G_MSC-B').

In both cases the call is switched in 3G_MSC-A; the circuit between 3G_MSC-A and 3G_MSC-B shall be released after a successful subsequent relocation has been performed.

If 3G_MSC-A is replaced by MSC-A in the procedures, then a subsequent relocation from 3G_MSC-B to 3G_MSC-B' shall not be possible since MSC-A does not support the RANAP protocol.

8.3.3.1 Description of subsequent relocation procedure i): 3G_MSC-B to 3G_MSC-A

The procedure for successful relocation from 3G_MSC-B back to 3G_MSC-A is shown in figure 32.

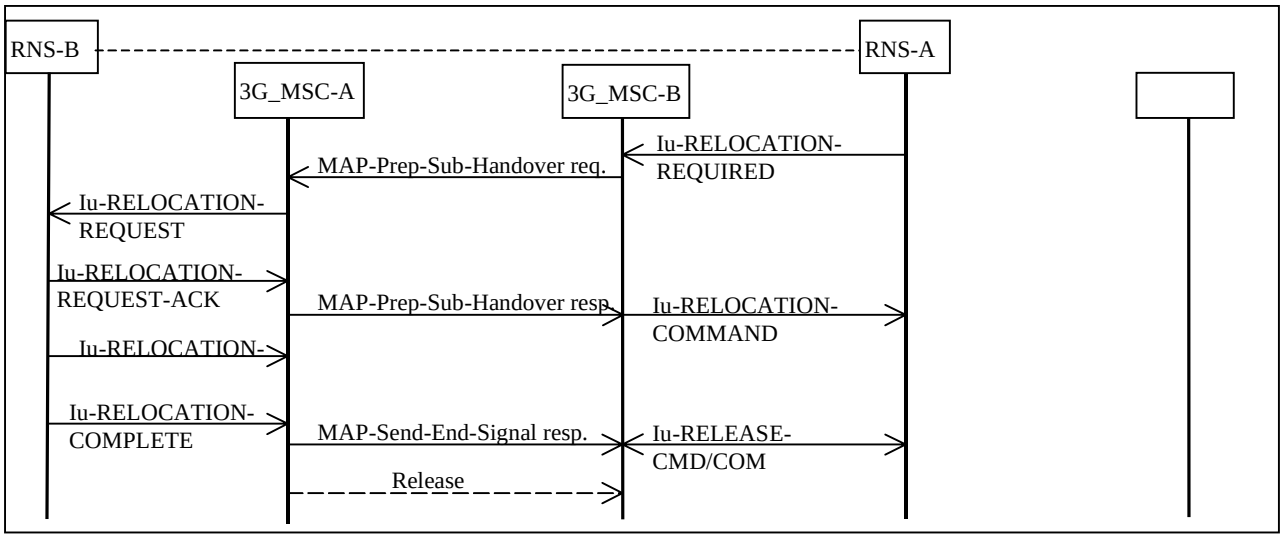

Figure 32: Subsequent relocation procedure i) successful relocation from 3G_MSC-B to 3G_MSC-A using a circuit connection

8.3.3.1.1 With one circuit connection

8.3.3.1.2 With multiple circuit connections (Optional functionality)

8.3.3.2 Description of subsequent relocation procedure ii): 3G_MSC-B to 3G_MSC-B'

8.3.3.2.1 With one circuit connection

8.3.3.2.2 With multiple circuit connections (Optional functionality)

8.3.3.2.2.1 3G_MSC-B' does not support multiple bearers

8.3.3.2.2.2 3G_MSC-B' supports multiple bearers

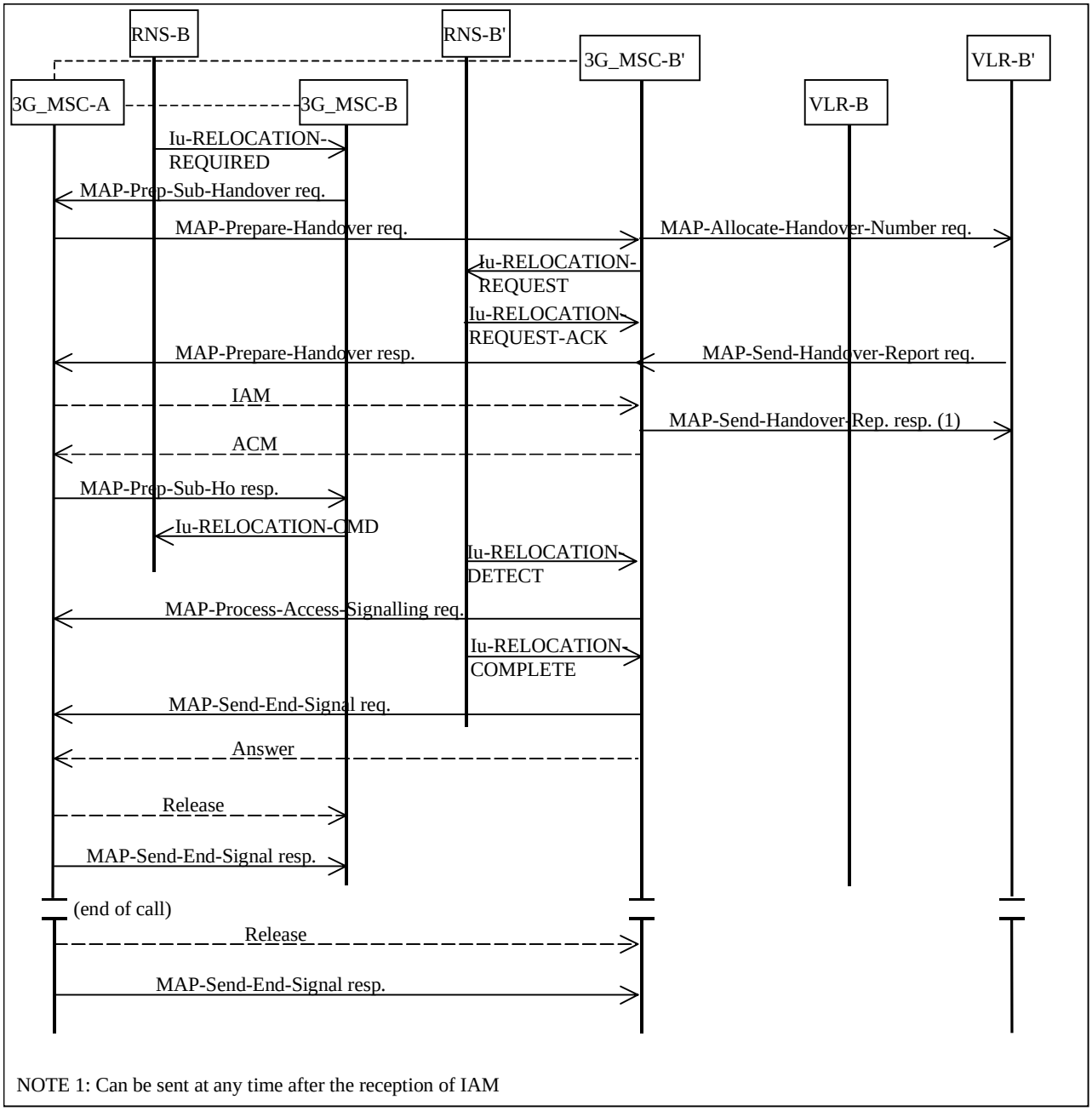

Figure 33: Subsequent relocation procedure ii) Successful SRNS relocation from 3G_MSC-B to 3G_MSC-B' requiring a circuit connection

8.3.4 Procedure for subsequent relocation not requiring a circuit connection ~~between 3G_MSC-A and 3G_MSC-B~~

As for the subsequent relocation with a circuit connection between 3G_MSC-A and 3G_MSC-B, the same two cases of subsequent relocation apply:

i) the UE moves back to the area of 3G_MSC-A;

ii) the UE moves into the area of a third 3G_MSC (3G_MSC-B').

If 3G_MSC-A is replaced by MSC-A in the procedures, then a subsequent relocation from 3G_MSC-B to 3G_MSC-B' shall not be possible since MSC-A does not support the RANAP protocol.

3GPP TSG-CN1 Meeting #14
Cardiff, Wales - 20 - 24 November, 2000

Tdoc N1-001410

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **323** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X**

Title:	⌘	RR connection replaced with PS signalling connection
Source:	⌘	Ericsson
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2000-11-23
Category:	⌘	**A**
Release:	⌘	REL-4

Use one 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 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:	⌘	With the LS in Tdoc N1-001146 (R2-001961), RAN2 are asking N1 to consider to align the terminology with RAN2, by considering introducing the terms “CS signalling connection” and “PS signalling connection”, since RAN2 does not use the term “RR connection”, and since the name itself is very close to “RRC connection” which means something different.
Summary of change:	⌘	RR connection has been replaced with PS signalling connection
Consequences if not approved:	⌘	

Clauses affected:	⌘	4.1, 4.7.3, 4.7.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

4 Elementary procedures for Mobility Management

4.1 General

This section describes the procedures used for mobility management for non-GPRS services and for GPRS-services at the radio interface (Reference Point Um and Uu).

The main function of the Mobility Management sublayer is to support the mobility of user terminals, such as informing the network of its present location and providing user identity confidentiality.

A further function of the MM sublayer is to provide connection management services to the different entities of the upper Connection Management (CM) sublayer (see TS 24.007).

There are two sets of procedures defined in this chapter:

- MM procedures for non-GPRS services (performed by the MM entity of the MM sublayer); and
- GMM procedures for GPRS services (performed by the GMM entity of the MM sublayer), see TS 24.007 [20].

All the MM procedures described in this section can only be performed if a RR connection has been established between the MS and the network. Else, the MM sublayer has to initiate the establishment of a RR connection (see GSM 04.18 section 3.3 and TS 25.331 section 8.2.3).

In A/Gb mode, ~~T~~the GMM procedures described in this section, use services provided by the RR sublayer without prior RR connection establishment.

In Iu mode: all the GMM procedures described in this section can only be performed if a PS signalling connection has been established between the MS and the network. Else, the GMM sublayer has to initiate the establishment of a PS signalling connection (see TS 25.331).

GMM procedures are mandatory and applicable only for GPRS MSs and networks supporting those MSs. For GPRS MSs which are IMSI attached for both GPRS and non-GPRS services, some MM procedures are replaced by GMM combined procedures provided that the network operates in network operation mode I, i.e. is supporting combined GMM procedures. GMM combined procedures are not applicable for the GPRS MS operation mode C but are mandatory for the GPRS MS operation modes A and B and networks supporting network operation mode I, see TS 23.060.

***** Next Modification *****

4.1.1 MM and GMM procedures

4.1.1.1 Types of MM and GMM procedures

Depending on how they can be initiated, three types of MM procedures can be distinguished:

1) MM common procedures:

   A MM common procedure can always be initiated whilst a RR connection exists. The procedures belonging to this type are:

   Initiated by the network:

   - TMSI reallocation procedure;
   - authentication procedure;
   - identification procedure;
   - MM information procedure;

- abort procedure.

  However, abort procedure is used only if an MM connection is being established or has already been established i.e. not during MM specific procedures or during IMSI detach procedure, see section 4.3.5.

Initiated by the mobile station:

- IMSI detach procedure (with the exceptions specified in section 4.3.4).

ii) MM specific procedures:

A MM specific procedure can only be initiated if no other MM specific procedure is running or no MM connection exists. The procedures belonging to this type are:

- normal location updating procedure;
- periodic updating procedure;
- IMSI attach procedure.

iii) MM connection management procedures:

These procedures are used to establish, maintain and release a MM connection between the mobile station and the network, over which an entity of the upper CM layer can exchange information with its peer. A MM connection establishment can only be performed if no MM specific procedure is running. More than one MM connection may be active at the same time. Depending on how they can be initiated, two types of GMM procedures can be distinguished:

i) GMM common procedures:

In Iu mode, a GMM common procedure can always be initiated whilst a PS signalling connection exists.

The procedures belonging to this type are:

Initiated by the network when a GMM context has been established:

- P-TMSI (re-) allocation;
- GPRS authentication and ciphering;
- GPRS identification;
- GPRS information.

ii) GMM specific procedures:

Initiated by the network and used to detach the IMSI in the network for GPRS services and/or non-GPRS services and to release a GMM context:

- GPRS detach.

Initiated by the MS and used to attach or detach the IMSI in the network for GPRS services and/or non-GPRS services and to establish or release a GMM context:

- GPRS attach and combined GPRS attach;
- GPRS detach and combined GPRS detach.

Initiated by the MS when a GMM context has been established:

- normal routing area updating and combined routing area updating;
- periodic routing area updating.

In UMTS, initiated by the MS and used to establish a secure connection to the network and/or to request the resource reservation for sending data:

- Service Request

***** Next Modification *****

4.7.3 GPRS attach procedure

The GPRS attach procedure is used for two purposes:

- normal GPRS attach, performed by the MS to IMSI attach for GPRS services only. The normal GPRS attach procedure shall be used by GPRS MSs in MS operation mode C, independent of the network operation mode. It shall also be used by GPRS MSs in MS operation modes A or B if the network operates in network operation mode II or III .
- combined GPRS attach procedure, used by GPRS MSs in MS operation modes A or B to attach the IMSI for GPRS and non-GPRS services provided that the network operates in network operation mode I.

With a successful GPRS attach procedure a GMM context is established.

Section 4.7.3.1 describes the GPRS attach procedure to attach the IMSI only for GPRS services. The combined GPRS attach procedure used to attach the IMSI for both GPRS and non-GPRS services is described in section 4.7.3.2.

If an IMSI attach for non-GPRS services is requested and a GMM context exists, the routing area updating procedure shall be used as described in section 4.7.5.2.

To limit the number of subsequently rejected attach attempts, a GPRS attach attempt counter is introduced. The GPRS attach attempt counter shall be incremented as specified in section 4.7.3.1.5. Depending on the value of the GPRS attempt counter, specific actions shall be performed. The GPRS attach attempt counter shall be reset when:

- the MS is powered on;
- a SIM is inserted;
- a GPRS attach procedure is successfully completed; or
- a combined GPRS attach procedure is completed for GPRS services only with cause #2, #16, #17 or #22
- a GPRS attach procedure is completed with cause #11, #12 or #13,

and additionally when the MS is in substate ATTEMPTING-TO-ATTACH:

- expiry of timer T3302;
- a new routing area is entered; or
- an attach is triggered by CM sublayer requests.

The mobile equipment shall contain a list of "forbidden location areas for roaming", as well as a list of "forbidden location areas for regional provision of service". The handling of these lists is described in section 4.4.1; the same lists are used by GMM and MM procedures.

4.7.3.1 GPRS attach procedure for GPRS services

The GPRS attach procedure is a GMM procedure used by GPRS MSs to IMSI attach for GPRS services.

The attach type information element shall indicate "GPRS attach".

4.7.3.1.1 GPRS attach procedure initiation

In state GMM-DEREGISTERED, the MS initiates the GPRS attach procedure by sending an ATTACH REQUEST message to the network, starts timer T3310 and enters state GMM-REGISTERED-INITIATED.

The MS capable both UMTS and GSM or only GSM system shall include a valid P-TMSI, if any is available, the P-TMSI signature associated with the P-TMSI and the routing area identity associated with the P-TMSI in the ATTACH REQUEST message. If there is no valid P-TMSI available, the IMSI shall be included instead of the P-TMSI and P-TMSI signature.

The MS shall also indicate within the DRX parameters whether it supports the split pg cycle option on CCCH. The optional support of the split pg cycle on CCCH by the network is indicated in SI13 or PSI1. Split pg cycle on CCCH is applied by both the network and the MS when the split pg cycle option is supported by both (see GSM 05.02).

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the GPRS attach procedure, it may set a follow-on request pending indicator on.

4.7.3.1.2 GMM common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM identification and GMM authentication and ciphering procedure, depending on the received information such as IMSI, CKSN, old RAI, P-TMSI and P-TMSI signature.

4.7.3.1.3 GPRS attach accepted by the network

If the GPRS attach request is accepted by the network, an ATTACH ACCEPT message is sent to the MS.

The P-TMSI reallocation may be part of the GPRS attach procedure. The P-TMSI that shall be allocated is then included in the ATTACH ACCEPT message together with the routing area identifier. The network shall, in this case, change to state GMM-COMMON-PROCEDURE-INITIATED and shall start timer T3350 as described in section 4.7.6. Furthermore, the network may assign a P-TMSI signature for the GMM context which is then also included in the ATTACH ACCEPT message. If the LAI or PLMN identity that has been transmitted in the ATTACH ACCEPT message is a member of any of the "forbidden" lists, any such entry shall be deleted. Additionally, the network shall include the radio priority level to be used by the MS for mobile originated SMS transfer in the ATTACH ACCEPT message.

In GSM, the Cell Notification information element shall be included in the ATTACH ACCEPT message by the network which indicates that the Cell Notification is supported by the network.

In UMTS, the network should prolong the ~~RR~~ PS signalling connection if the mobile station has indicated a follow-on request pending in ATTACH REQUEST. The network may also prolong the ~~RR~~ PS signalling connection without any indication from the mobile terminal.

The MS, receiving an ATTACH ACCEPT message, stores the received routing area identification, stops timer T3310, reset the GPRS attach attempt counter, reset the routing area updating attempt counter, enters state GMM-REGISTERED and sets the GPRS update status to GU1 UPDATED.

If the message contains a P-TMSI, the MS shall use this P-TMSI as the new temporary identity for GPRS services. In this case, an ATTACH COMPLETE message is returned to the network. The MS shall delete its old P-TMSI and shall store the new one. If no P-TMSI has been included by the network in the ATTACH ACCEPT message, the old P-TMSI, if any available, shall be kept.

If the message contains a P-TMSI signature, the MS shall use this P-TMSI signature as the new temporary signature for the GMM context. The MS shall delete its old P-TMSI signature, if any is available, and shall store the new one. If the message contains no P-TMSI signature, the old P-TMSI signature, if available, shall be deleted.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

In GSM, if the ATTACH ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates. The network receiving an ATTACH COMPLETE message stops timer T3350, changes to GMM-REGISTERED state and considers the P-TMSI sent in the ATTACH ACCEPT message as valid.

***** Next Modification *****

4.7.3.2 Combined GPRS attach procedure for GPRS and non-GPRS services

The combined GPRS attach procedure is a GMM procedure used by a GPRS MS operating in MS operation modes A or B for IMSI attach for GPRS and non-GPRS services if the network operates in network operation mode I:.

If a GPRS MS operating in MS operation modes A or B is already attached for non-GPRS services by use of the MM specific IMSI attach procedure, but additionally wishes to perform an IMSI attach for GPRS services, the combined GPRS attach procedure shall also be used.

The attach type information element shall indicate "combined GPRS attach". In this case, the messages ATTACH ACCEPT, ATTACH COMPLETE, and ATTACH REJECT used by the combined GPRS attach procedure carry information for both the GPRS and the non-GPRS services.

4.7.3.2.1 Combined GPRS attach procedure initiation

If the MS is in GMM state GMM-DEREGISTERED and in MM state MM IDLE, the MS initiates the combined GPRS attach procedure by sending an ATTACH REQUEST message to the network, starts timer T3310 and enters state GMM-REGISTERED-INITIATED and MM LOCATION UPDATING PENDING.

The MS shall include a valid P-TMSI, if available, the P-TMSI signature associated with the P-TMSI and the routing area identity associated with the P-TMSI in the ATTACH REQUEST message. If there is no valid P-TMSI available, the IMSI shall be included instead of the P-TMSI and P-TMSI signature. Furthermore the MS shall include the TMSI status IE if no valid TMSI is available.

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the GPRS attach, it may set a follow-on request pending indicator on.

***** Next Modification *****

4.7.5 Routing area updating procedure

This procedure is used for:

- normal routing area updating to update the registration of the actual routing area of an MS in the network. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services if the network operates in network operation mode II or III;

- combined routing area updating to update the registration of the actual routing and location area of an MS in the network. This procedure is used by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services provided that the network operates in network operation mode I; or

- periodic routing area updating. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS or for GPRS and non-GPRS services independent of the network operation mode;

- IMSI attach for non-GPRS services when the MS is IMSI attached for GPRS services. This procedure is used by GPRS MSs in MS operation modes A or B, if the network operates in network operation mode I.

- in GSM, resuming GPRS services when the RR sublayer indicated a resumption failure after dedicated mode was left, see GSM 04.18.

- UMTS to GSM and for GSM to UMTS intersystem change, see section 4.7.1.7.

Section 4.7.5.1 describes the routing area updating procedures for updating the routing area only. The combined routing area updating procedure used to update both the routing and location area is described in section 4.7.5.2.

The routing area updating procedure is always initiated by the MS. It is only invoked in state GMM-REGISTERED.

To limit the number of subsequently rejected routing area update attempts, a routing area updating attempt counter is introduced. The routing area updating attempt counter shall be incremented as specified in section 4.7.5.1.5. Depending on the value of the routing area updating attempt counter, specific actions shall be performed. The routing area updating attempt counter shall be reset when:

- a GPRS attach procedure is successfully completed; or

- a routing area updating procedure is successfully completed;

and additionally when the MS is in substate ATTEMPTING-TO-UPDATE:

- a new routing area is entered;
- expiry of timer T3302; or
- at request from registration function.

The mobile equipment shall contain a list of "forbidden location areas for roaming", as well as a list of "forbidden location areas for regional provision of service". The handling of these lists is described in section 4.4.1.

In, GSM, user data transmission in the MS shall be suspended during the routing area updating procedure; user data reception shall be possible. User data transmission in the network shall be suspended during the routing area updating procedure, if a new P-TMSI is assigned.

In UMTS, user data transmission and reception in the MS shall not be suspended during the routing area updating procedure. User data transmission in the network shall not be suspended during the routing area updating procedure.

4.7.5.1 Normal and periodic routing area updating procedure

Periodic routing area updating is used to periodically notify the availability of the MS to the network. The value of the update type IE in the ROUTING AREA UPDATE REQUEST message shall indicate "periodic updating". The procedure is controlled in the MS by timer T3312. When timer T3312 expires, the periodic routing area updating procedure is started. Start and reset of timer T3312 is described in section 4.7.2.2.

In GSM, the normal routing area updating procedure is initiated when the MS detects a change of the routing area in state GMM-REGISTERED, or when the MS determines that GPRS resumption shall be performed. The ROUTING AREA UPDATE REQUEST message shall always be the first data sent by the MS when a routing area border is crossed. The routing area identification is broadcast on the broadcast channel(s).

In UMTS, the normal routing area updating procedure is initiated when the MS detects a change of the routing area in state GMM-REGISTERED. The ROUTING AREA UPDATE REQUEST message shall always be the first GMM message sent by the MS when a routing area border is crossed.

A normal routing area updating shall abort any ongoing GMM procedure. Aborted GMM procedures may be repeated after the normal routing area updating procedure has been successfully performed. The value of the update type IE included in the message shall indicate "normal routing area updating".

4.7.5.1.1 Normal and periodic routing area updating procedure initiation

To initiate the normal routing area updating procedure, the MS sends the message ROUTING AREA UPDATE REQUEST to the network, starts timer T3330 and changes to state GMM-ROUTING-AREA-UPDATING-INITIATED. The message ROUTING AREA UPDATE REQUEST shall contain the P-TMSI signature when received within a previous ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message.

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the normal routing area updating procedure, it may set a follow-on request pending indicator on.

4.7.5.1.2 GMM Common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM authentication and ciphering procedure.

4.7.5.1.3 Normal and periodic routing area updating procedure accepted by the network

If the routing area updating request has been accepted by the network, a ROUTING AREA UPDATE ACCEPT message shall be sent to the MS. The network may assign a new P-TMSI and/or a new P-TMSI signature for the MS. If a new P-TMSI and/or P-TMSI signature have been assigned to the MS, it/they shall be included in the ROUTING AREA UPDATE ACCEPT message together with the routing area identification.

In GSM the Cell Notification information element shall be included in the ROUTING AREA UPDATE ACCEPT message in order to indicate the ability of the network to support the Cell Notification.

The network shall change to state GMM-COMMON-PROCEDURE-INITIATED and shall start the supervision timer T3350 as described in section 4.7.6.

If the LAI or PLMN identity contained in the ROUTING AREA UPDATE ACCEPT message is a member of any of the "forbidden" lists then any such entry shall be deleted.

In UMTS, the network should prolong the ~~RR~~ PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the ~~RR~~ PS signalling connection without any indication from the mobile terminal.

Upon receipt of a ROUTING AREA UPDATE ACCEPT message, the MS stores the received routing area identification, stops timer T3330, shall reset the routing area updating attempt counter and sets the GPRS update status to GU1 UPDATED. If the message contains a P-TMSI, the MS shall use this P-TMSI as new temporary identity for GPRS services and shall store the new P-TMSI. If no P-TMSI was included by the network in the ROUTING AREA UPDATING ACCEPT message, the old P-TMSI shall be kept. Furthermore, the MS shall store the P-TMSI signature if received in the ROUTING AREA UPDATING ACCEPT message. If no P-TMSI signature was included in the message, the old P-TMSI signature, if available, shall be deleted.

In GSM, if the ROUTING AREA UPDATE ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contained:

- a P-TMSI; and/or
- Receive N-PDU Numbers (see 04.65 [78] and TS 25.322).

In this case the Receive N-PDU Numbers values valid in the MS, shall be included in the ROUTING AREA UPDATE COMPLETE message.

NOTE: In UMTS, after a routing area updating procedure, the mobile station can initiate Service Request procedure to request the resource reservation for the active PDP contexts if the resources have been released by the network or send upper layer message (e.g. ACTIVATE PDP CONTEXT REQUEST) to the network via the existing PS signaling connection.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

***** Next Modification *****

4.7.5.2 Combined routing area updating procedure

Within a combined routing area updating procedure the messages ROUTING AREA UPDATE ACCEPT and ROUTING AREA UPDATE COMPLETE carry information for the routing area updating and the location area updating.

4.7.5.2.1 Combined routing area updating procedure initiation

The combined routing area updating procedure is initiated only by a GPRS MS operating in MS operation modes A or B, if the MS is in state GMM-REGISTERED and if the network operates in network operation mode I:

- when a GPRS MS that is IMSI attached for GPRS and non-GPRS services detects a change of the routing area in state GMM-REGISTERED and MM-IDLE;
- when a GPRS MS that is IMSI attached for GPRS services wants to perform an IMSI attach for non-GPRS services;
- after termination of a non-GPRS service via non-GPRS channels to update the association if the MS has changed the LA during that non-GPRS service transaction; or.
- after a CM SERVICE REJECT message with cause value #4 is received by the mobile station (see section 4.5.1.1), in which case the update type IE shall be set to "Combined RA/LA updating with IMSI attach".

In GSM, the routing and location area identification are broadcast on the broadcast channel(s). A combined routing area updating procedure shall abort any ongoing GMM procedure. Aborted GMM procedures shall be repeated after the combined routing area updating procedure has been successfully performed. The ROUTING AREA UPDATE

REQUEST message shall always be the first message sent from the MS in the new routing area after routing area change.

In UMTS, the routing and location area identification are broadcast on the broadcast channel(s) or sent to the MS via the PS signaling connection. A combined routing area updating procedure shall abort any ongoing GMM procedure. Aborted GMM procedures may be repeated after the combined routing area updating procedure has been successfully performed. The ROUTING AREA UPDATE REQUEST message shall always be the first GMM message sent from the MS in the new routing area after routing area change.

To initiate a combined routing area updating procedure the MS sends the message ROUTING AREA UPDATE REQUEST to the network, starts timer T3330 and changes to state GMM-ROUTING-UPDATING-INITIATED and MM LOCATION UPDATING PENDING. The value of the update type IE in the message shall indicate "combined RA/LA updating". If for the last attempt to update the registration of the location area a MM specific procedure was performed, the value of the update type IE in the ROUTING AREA UPDATE REQUEST message shall indicate "combined RA/LA updating with IMSI attach". Furthermore the MS shall include the TMSI status IE if no valid TMSI is available.

A GPRS MS in MS operation modes A or B that is in an ongoing circuit-switched transaction, shall initiate the combined routing area updating procedure after the circuit-switched transaction has been released, if the MS has changed the RA during the circuit-switched transaction and if the network operates in network operation mode I.

A GPRS MS in MS operation mode A shall initiate the combined routing area updating procedure with IMSI attach after the circuit-switched transaction has been released if a GPRS attach was performed during the circuit-switched transaction and provided that the network operates in network operation mode I.

A GPRS MS in MS operation mode A shall perform the normal routing area update procedure during an ongoing circuit-switched transaction.

In UMTS, if the MS wishes to prolong the established ~~RR~~ PS signalling connection after the normal routing area updating procedure when it is served under UMTS area, it may set a follow-on request pending indicator on.

4.7.5.2.2 GMM Common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM authentication and ciphering procedure.

4.7.5.2.3 Combined routing area updating procedure accepted by the network

Depending on the value of the update result IE received in the ROUTING AREA UPDATE ACCEPT message, two different cases can be distinguished:

Case 1) The update result IE value indicates "combined RA/LA": Routing and location area updating is successful;

Case 2) The update result IE value indicates "RA only": Routing area updating is successful, but location area updating is not successful.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contains:

- a P-TMSI and/or a TMSI; and/or
- Receive N-PDU Numbers (see 04.65 [78] and TS 25.322).

In the latter case, the Receive N-PDU Numbers that are valid in the MS shall be included in the ROUTING AREA UPDATE COMPLETE message.

In UMTS, the network should prolong the ~~RR~~ PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the ~~RR~~ PS signalling connection without any indication from the mobile terminal.