3GPP TSG_CN **Tdoc NP-000270**
Plenary Meeting #8, Dusseldorf, Germany
21st – 23rd June 2000.

Source: **TSG_N WG "1"**

Title: **CRs to 3G Work Item "GSM-UMTS Interworking"**

Agenda item: **6.16**

Document for: **APPROVAL**

Introduction:

This document contains **"15"** CRs on **Work Item "GSM-UMTS interworking",** that have been agreed by **TSG_N WG "1",** and are forwarded to **TSG_N Plenary** meeting #8 for approval.

Tdoc	Spec	CR	Rev	CAT	Rel.	Old Ver	New Ver	Subject
N1-000607	23.009	CR009		C	R99	3.2.1	3.3.0	Clean-up of 3G_MSC-A_HO SDLs
N1-000608	23.009	CR010		C	R99	3.2.1	3.3.0	Clean-up of 3G_MSC-B_HO SDLs
N1-000619	24.007	CR012		F	R99	3.3.1	3.4.0	Remove GRR primitive descriptions and make reference to other document
N1-000620	24.007	CR006	r2	F	R99	3.3.1	3.4.0	Updating SM for R99
N1-000643	24.008	CR203		F	R99	3.3.1	3.4.0	Editorial corrections to MM and GMM in 24.008
N1-000669	24.007	CR016		C	R99	3.3.1	3.4.0	Services provided by the Radio Resource Management entity
N1-000670	24.008	CR215		F	R99	3.3.1	3.4.0	Correction of references in protocol error handling for SM
N1-000697	24.008	CR184	1	C	R99	3.3.1	3.4.0	Introduction of 3G MS capabilities in MS Classmark 3 (Introduction of 3G MS capabilities in MS Classmark 3)
N1-000736	24.008	CR194	1	F	R99	3.3.1	3.4.0	Clarifications on GSM – UMTS interoperability
N1-000755	24.008	CR189	1	F	R99	3.3.1	3.4.0	DRX value 0000 clarification and R97 compatibility issue
N1-000756	24.008	CR190	1	F	R99	3.3.1	3.4.0	Compatibility issue due to deletion of SM cause #35
N1-000759	24.008	CR220	1	B	R99, R00	3.3.1	3.4.0	Modification of QoS to support max 0kbps
N1-000794	24.008	CR195	2	F	R99	3.3.1	3.4.0	MS behavior if RAU attempt counter is greater than or equal to 5
N1-000796	23.122	CR003	5	F	R99	3.2.0	3.3.0	Modification of PLMN Selection Procedures to support UMTS+COMPACT Network Selection
N1-000807	24.008	CR221	2	B	R99, R00	3.3.1	3.4.0	Recovery from PDP context inconsistency

3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

***Document* N1-000607**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.009	CR	009	Current Version:	3.2.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-N #8	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: Telelogic, Ericsson **Date:** 2000/05/22

Subject: Clean-up of 3G_MSC-A_HO SDLs

Work item: GSM / UMTS Interworking

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:
General clean-up:
Sheet 4: Branch 4 is joined to branch 3 AFTER "Reset T502".
Sheet 12: Branch 4 is joined to branch 3 AFTER "Reset T702".
Sheet 18: The entry called 6 (1st branch) is removed, there is no 6 anywhere.
Sheet 32: Last boxes of branches 1 and 2 are exchanged.
Sheet 49: Branch 1, box 4: MS should be UE/MS.
Sheet 54: Last boxes of branches 1 and 2 are exchanged.
Sheet 64: Last branch, box 4, MSC-A changed to 3G_MSC-A.
Sheet 76: Last boxes of branches 1 and 2 are exchanged.

Clauses affected:

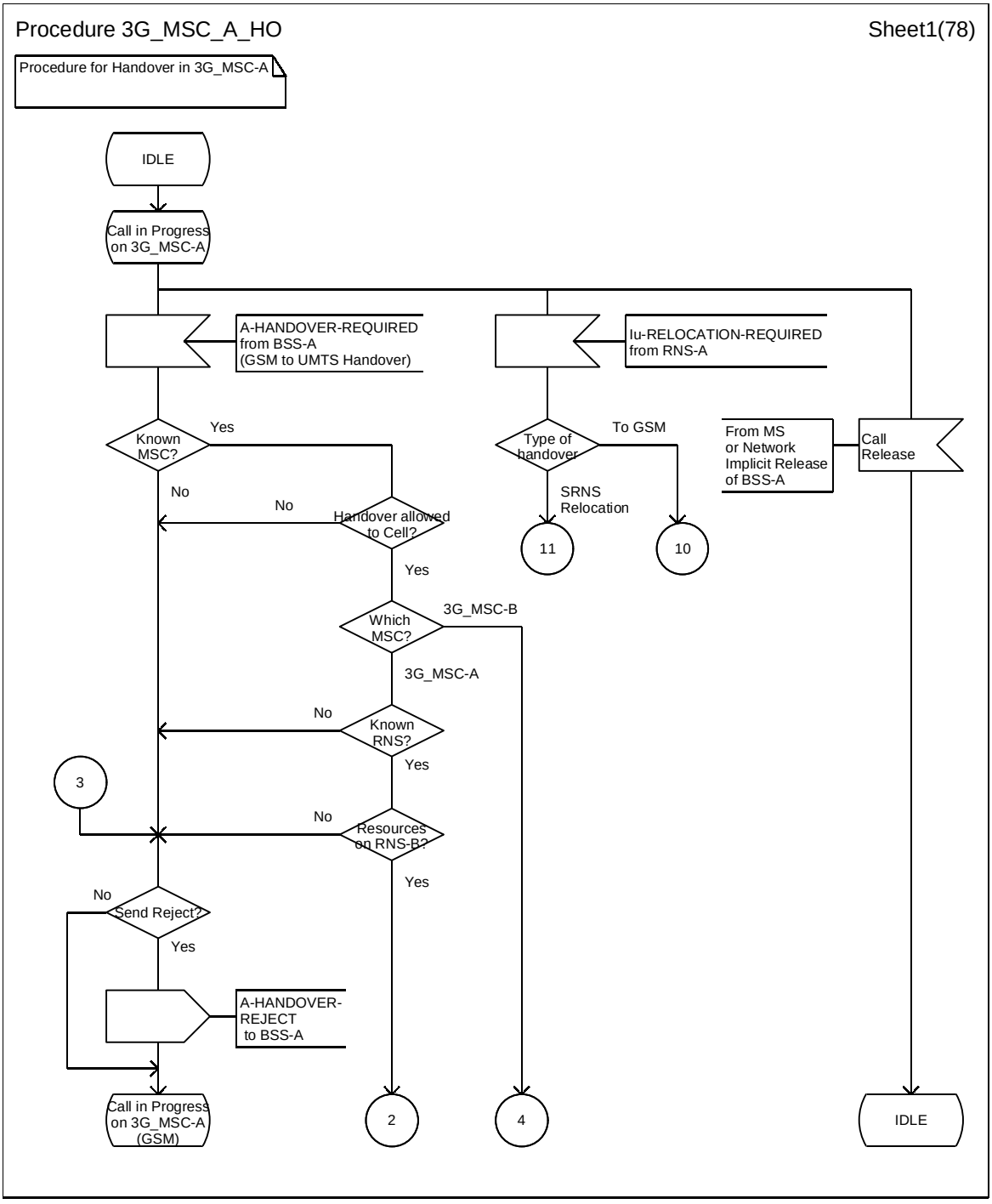
Other specs affected:

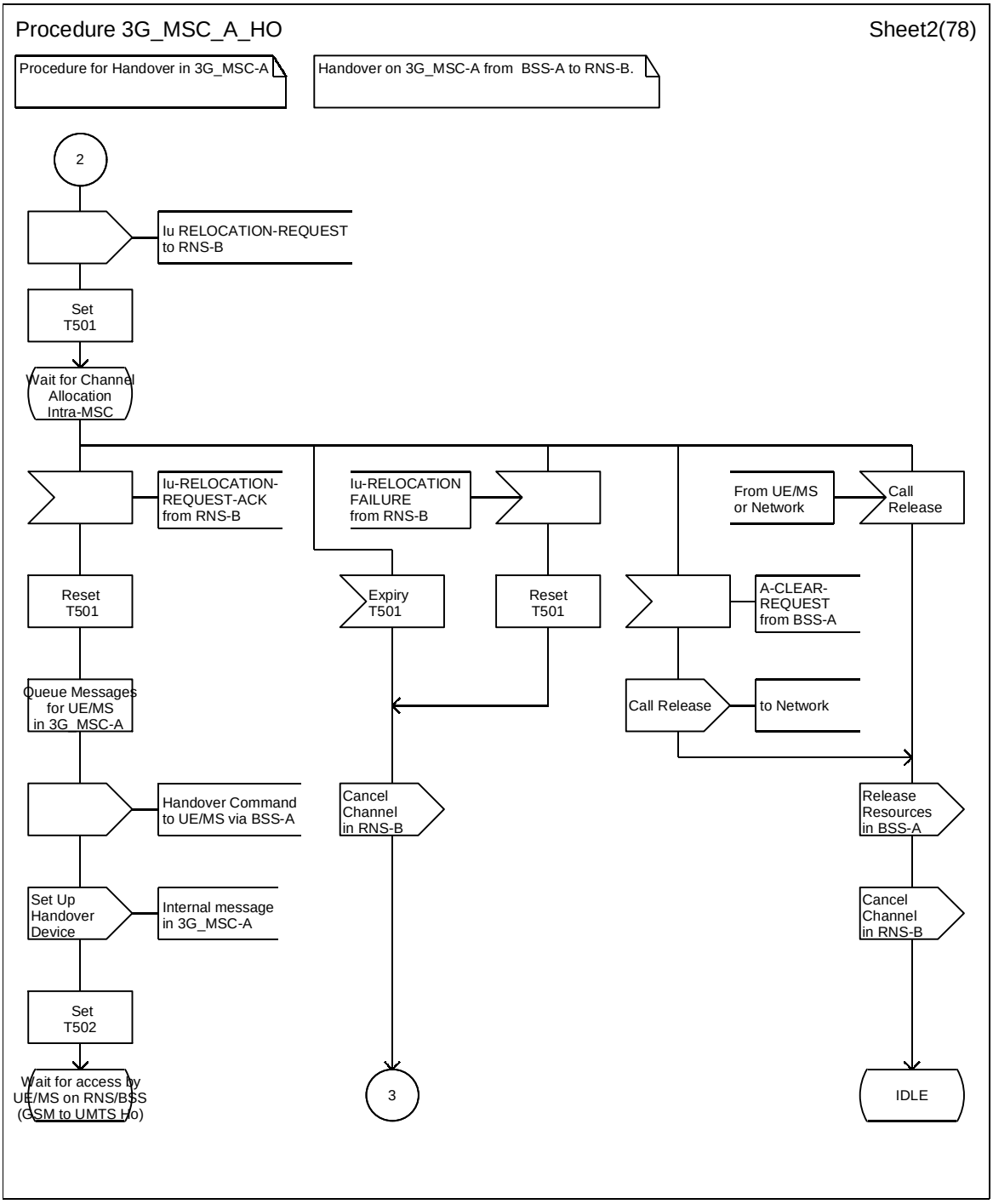
Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

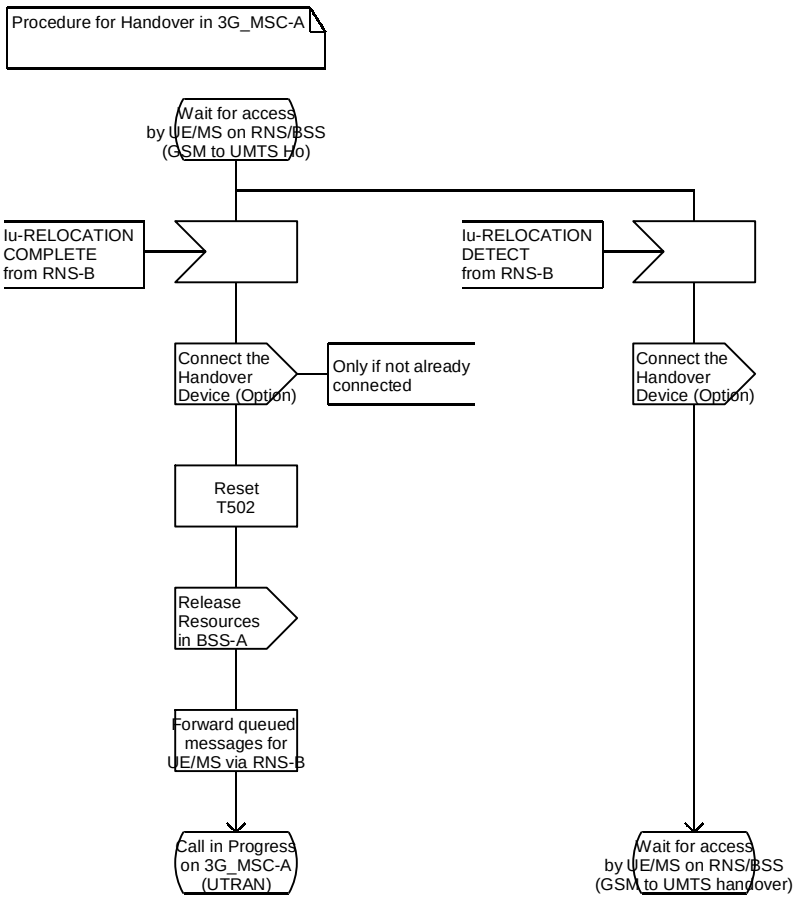
Other comments:

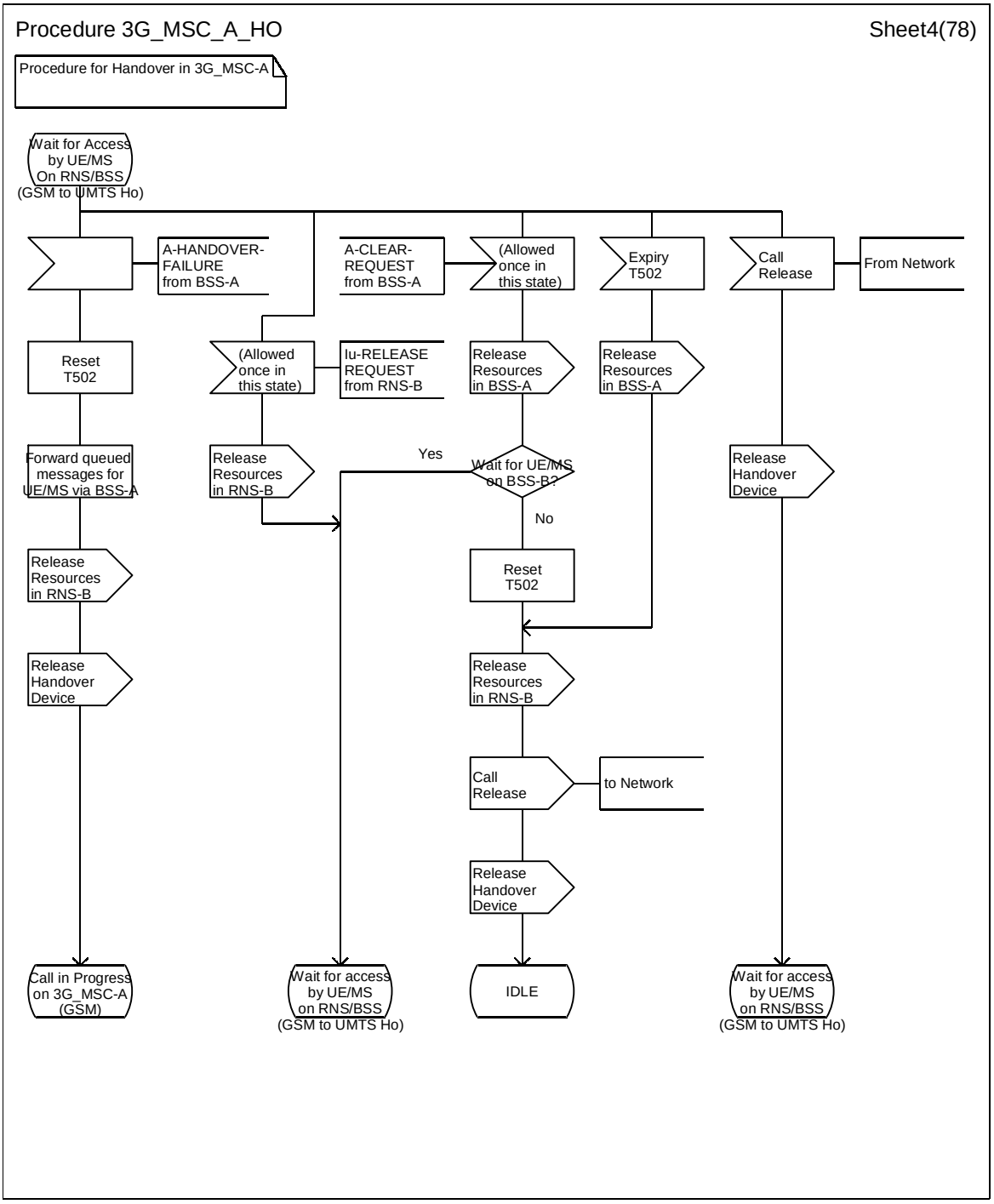

help.doc

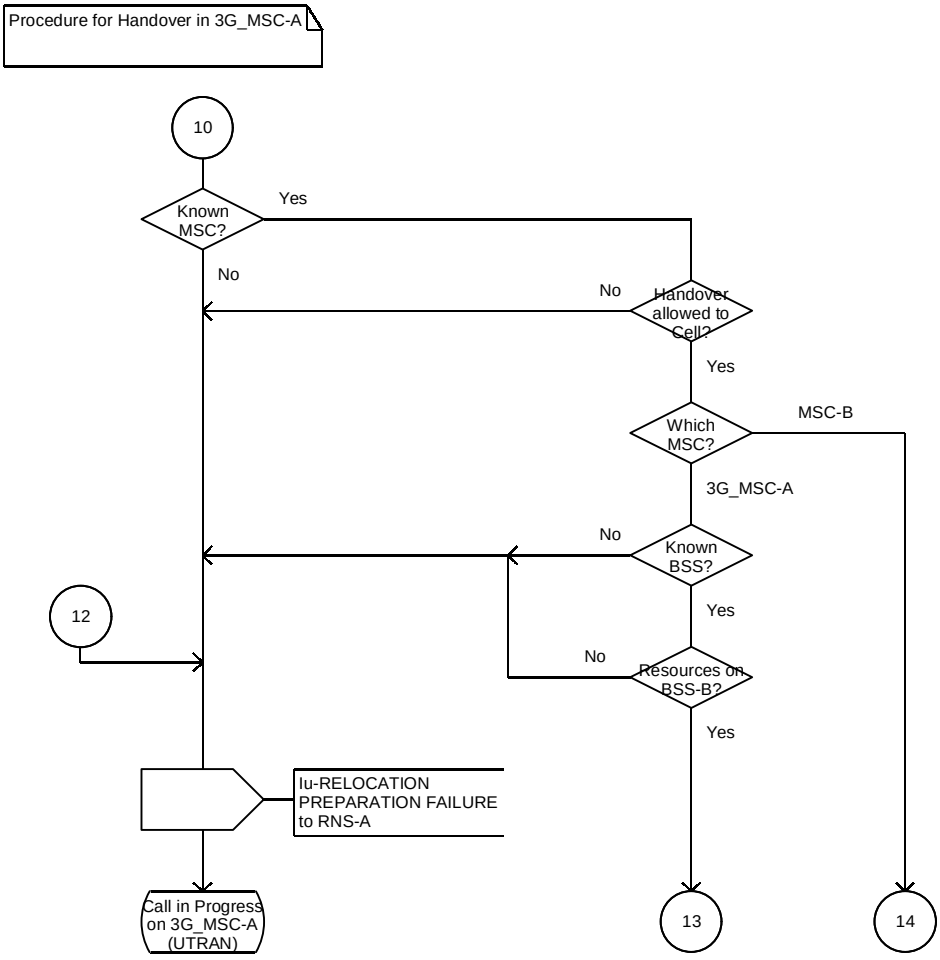
<--------- double-click here for help and instructions on how to create a CR.

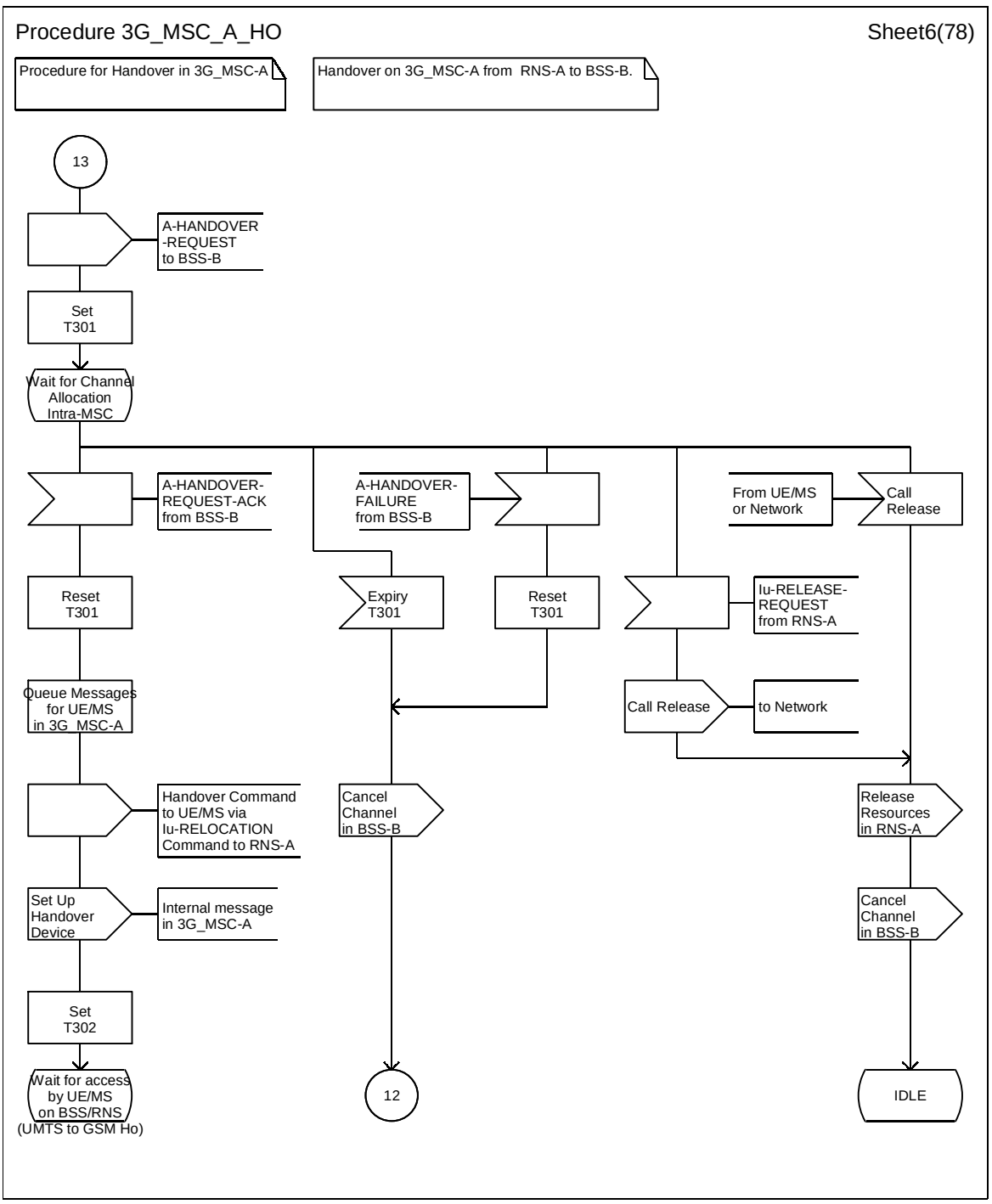

Procedure for Handover in 3G_MSC-A
IDLE
Call in Progress on 3G_MSC-A
A-HANDOVER-REQUIRED from BSS-A (GSM to UMTS Handover)
Iu-RELOCATION-REQUIRED from RNS-A
Known MSC?
Yes
No
No
Handover allowed to Cell?
Yes
Type of handover
To GSM
SRNS Relocation
From MS or Network Implicit Release of BSS-A
Call Release
11
10
Which MSC?
3G_MSC-B
3G_MSC-A
No
Known RNS?
Yes
3
No
Resources on RNS-B?
Yes
No
Send Reject?
Yes
A-HANDOVER-REJECT to BSS-A
Call in Progress on 3G_MSC-A (GSM)
2
4
IDLE

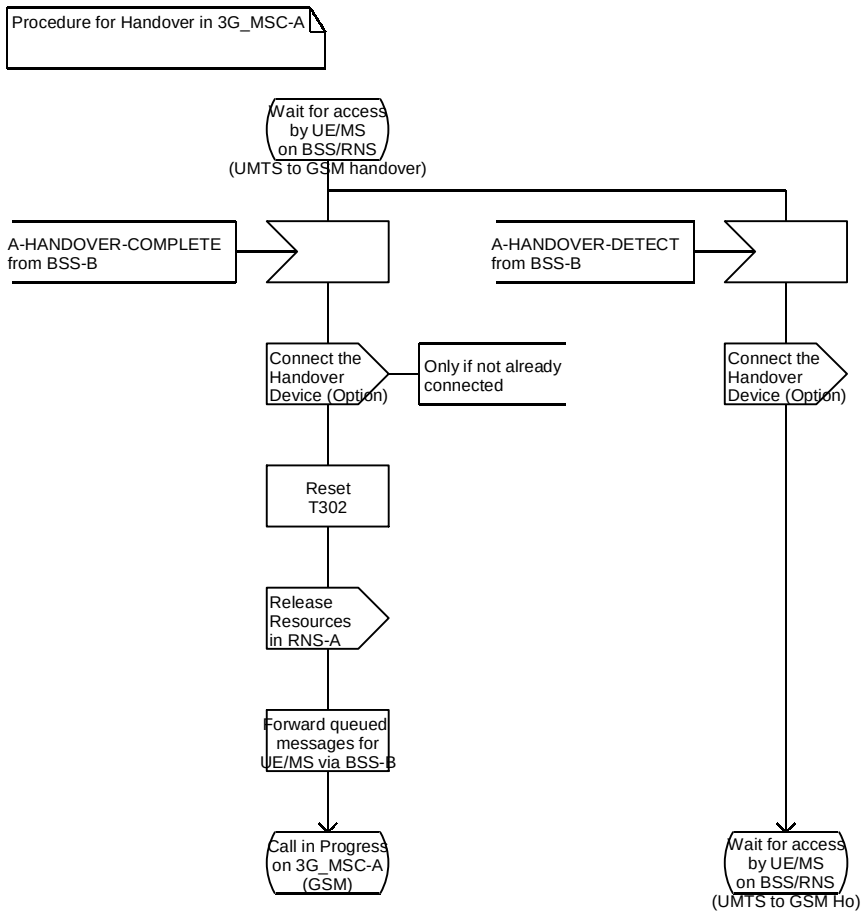

Procedure for Handover in 3G_MSC-A
Handover on 3G_MSC-A from BSS-A to RNS-B.
2
Iu RELOCATION-REQUEST to RNS-B
Set T501
Wait for Channel Allocation Intra-MSC
Iu-RELOCATION-REQUEST-ACK from RNS-B
Iu-RELOCATION FAILURE from RNS-B
From UE/MS or Network
Call Release
Reset T501
Expiry T501
Reset T501
A-CLEAR-REQUEST from BSS-A
Queue Messages for UE/MS in 3G_MSC-A
Call Release
to Network
Handover Command to UE/MS via BSS-A
Cancel Channel in RNS-B
Release Resources in BSS-A
Set Up Handover Device
Internal message in 3G_MSC-A
Cancel Channel in RNS-B
Set T502
Wait for access by UE/MS on RNS/BSS (GSM to UMTS Ho)
3
IDLE

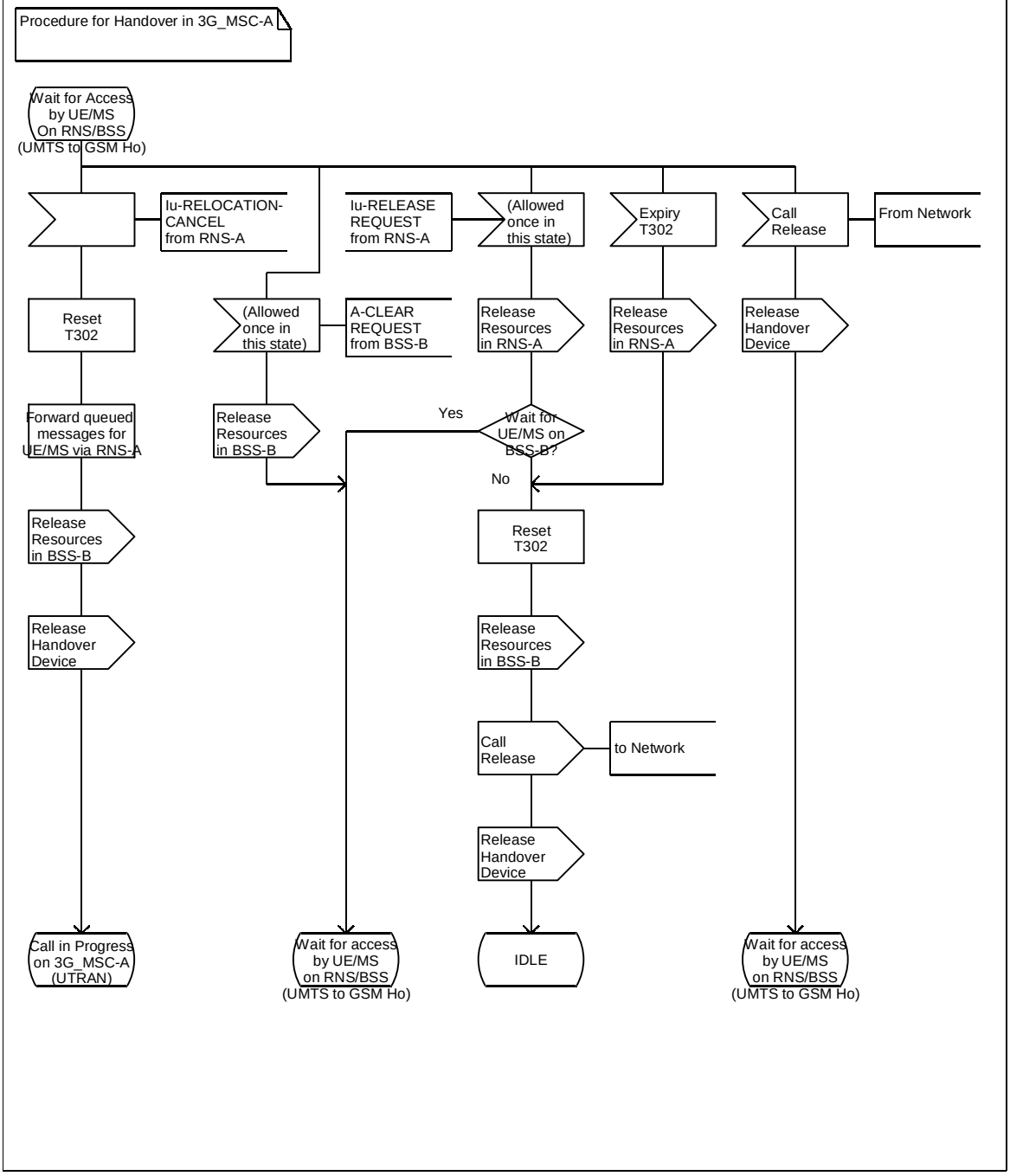

Procedure for Handover in 3G_MSC-A
Wait for access by UE/MS on RNS/BSS (GSM to UMTS Ho)
Iu-RELOCATION COMPLETE from RNS-B
Iu-RELOCATION DETECT from RNS-B
Connect the Handover Device (Option)
Only if not already connected
Connect the Handover Device (Option)
Reset T502
Release Resources in BSS-A
Forward queued messages for UE/MS via RNS-B
Call in Progress on 3G_MSC-A (UTRAN)
Wait for access by UE/MS on RNS/BSS (GSM to UMTS handover)

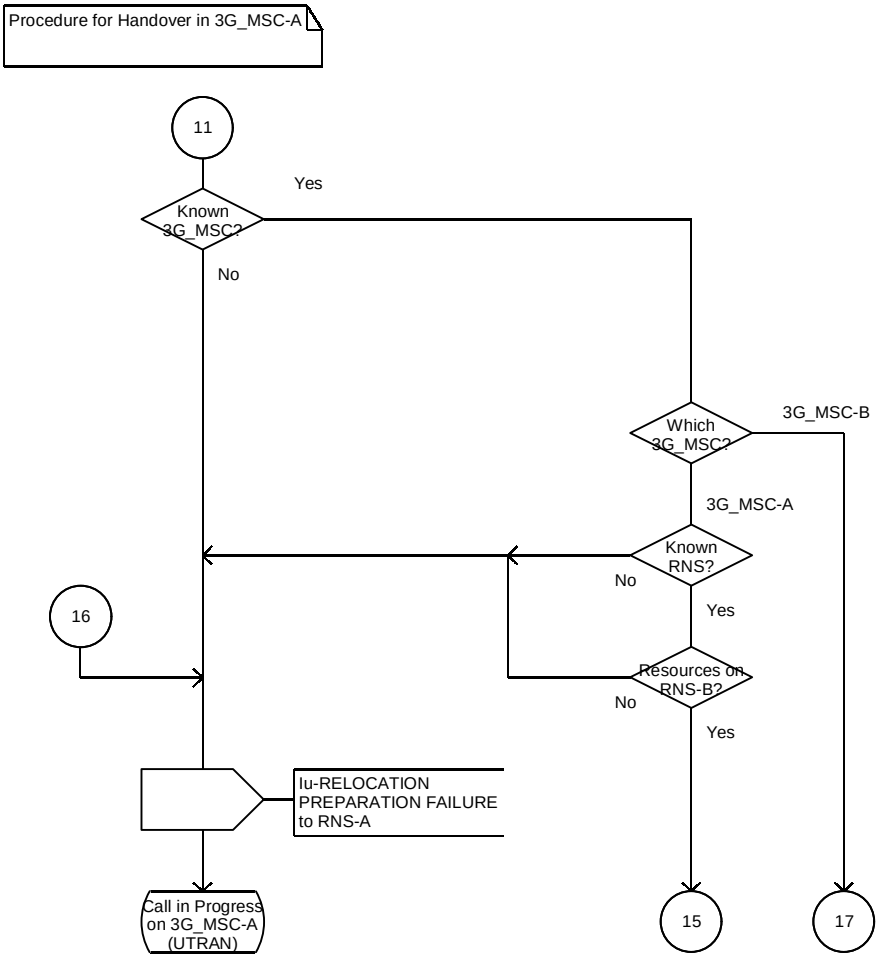

Procedure for Handover in 3G_MSC-A
Wait for Access by UE/MS On RNS/BSS (GSM to UMTS Ho)
A-HANDOVER-FAILURE from BSS-A
A-CLEAR-REQUEST from BSS-A
(Allowed once in this state)
Expiry T502
Call Release
From Network
Reset T502
(Allowed once in this state)
Iu-RELEASE REQUEST from RNS-B
Release Resources in BSS-A
Release Resources in BSS-A
Forward queued messages for UE/MS via BSS-A
Release Resources in RNS-B
Yes
Wait for UE/MS on BSS-B?
Release Handover Device
No
Release Resources in RNS-B
Reset T502
Release Handover Device
Release Resources in RNS-B
Call Release
to Network
Release Handover Device
Call in Progress on 3G_MSC-A (GSM)
Wait for access by UE/MS on RNS/BSS (GSM to UMTS Ho)
IDLE
Wait for access by UE/MS on RNS/BSS (GSM to UMTS Ho)

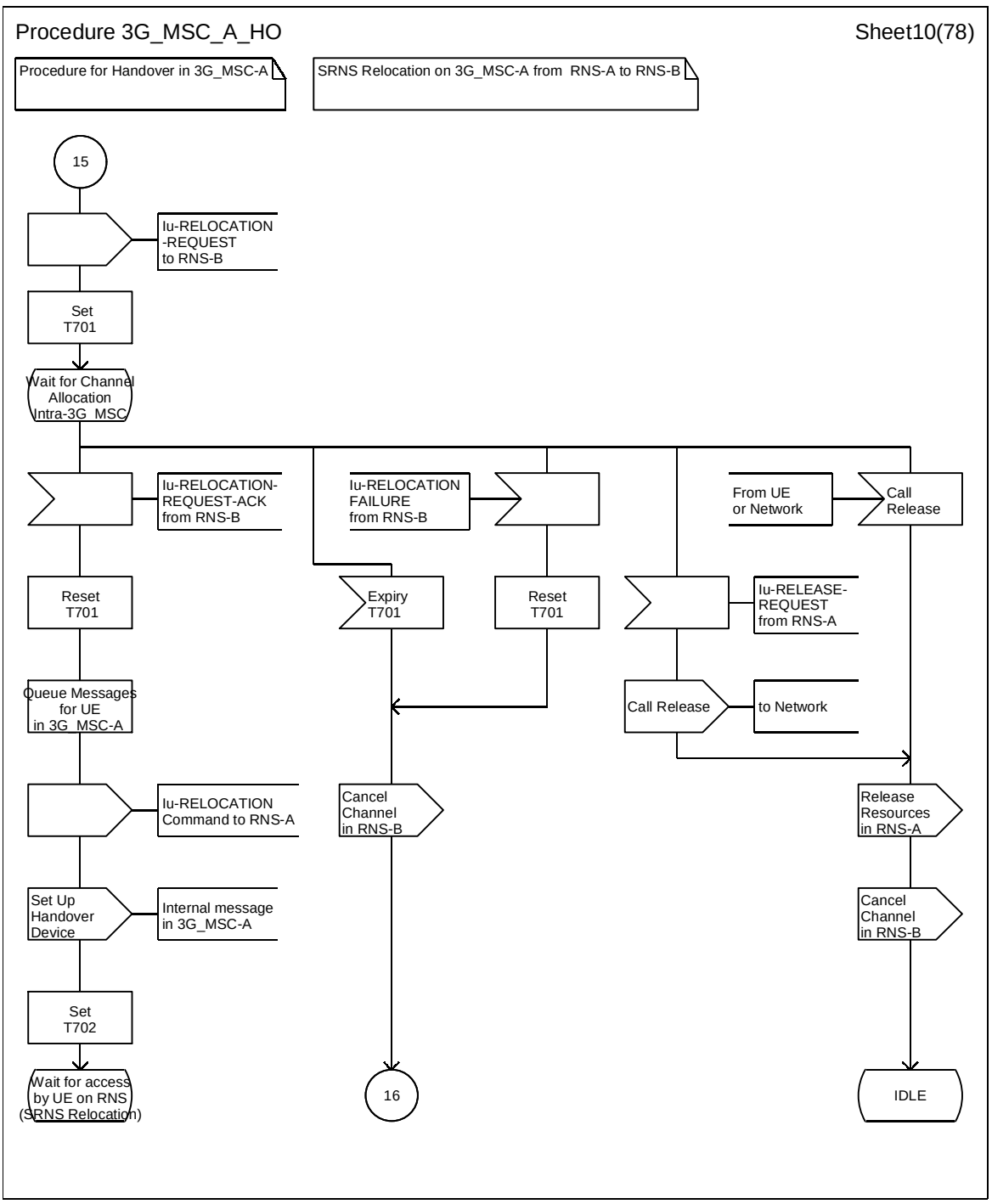

Procedure for Handover in 3G_MSC-A
10
Known MSC?
Yes
No
No
Handover allowed to Cell?
Yes
Which MSC?
MSC-B
3G_MSC-A
No
Known BSS?
Yes
12
No
Resources on BSS-B?
Yes
Iu-RELOCATION PREPARATION FAILURE to RNS-A
Call in Progress on 3G_MSC-A (UTRAN)
13
14

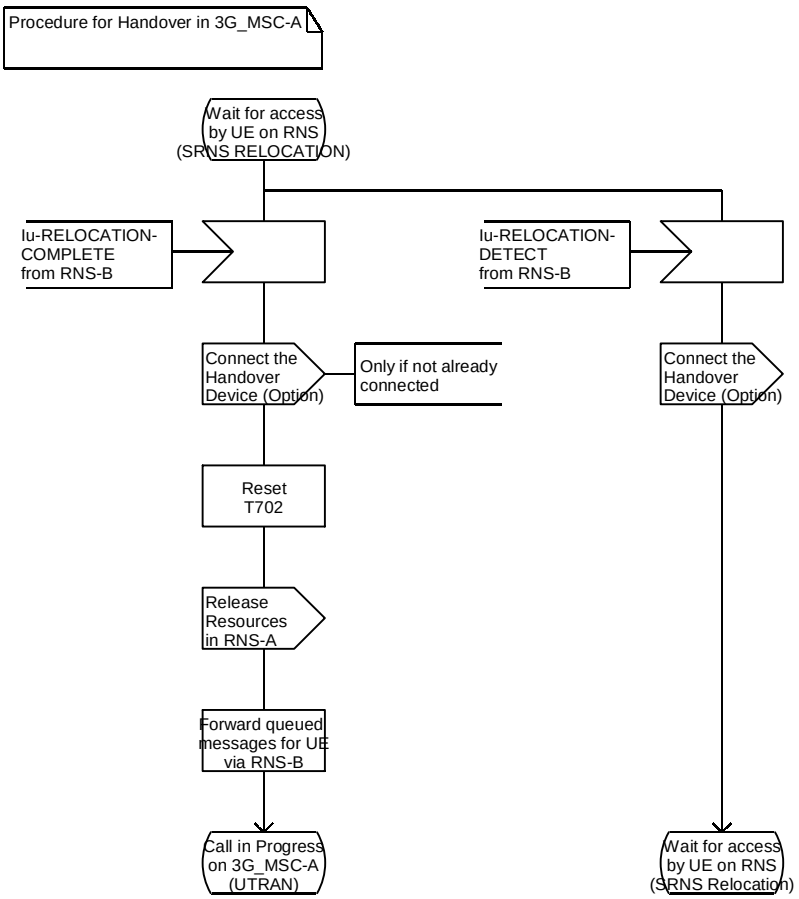

Procedure for Handover in 3G_MSC-A
Handover on 3G_MSC-A from RNS-A to BSS-B.
13
A-HANDOVER -REQUEST to BSS-B
Set T301
Wait for Channel Allocation Intra-MSC
A-HANDOVER-REQUEST-ACK from BSS-B
A-HANDOVER-FAILURE from BSS-B
From UE/MS or Network
Call Release
Reset T301
Expiry T301
Reset T301
Iu-RELEASE-REQUEST from RNS-A
Queue Messages for UE/MS in 3G_MSC-A
Call Release
to Network
Handover Command to UE/MS via Iu-RELOCATION Command to RNS-A
Cancel Channel in BSS-B
Release Resources in RNS-A
Set Up Handover Device
Internal message in 3G_MSC-A
Cancel Channel in BSS-B
Set T302
Wait for access by UE/MS on BSS/RNS (UMTS to GSM Ho)
12
IDLE

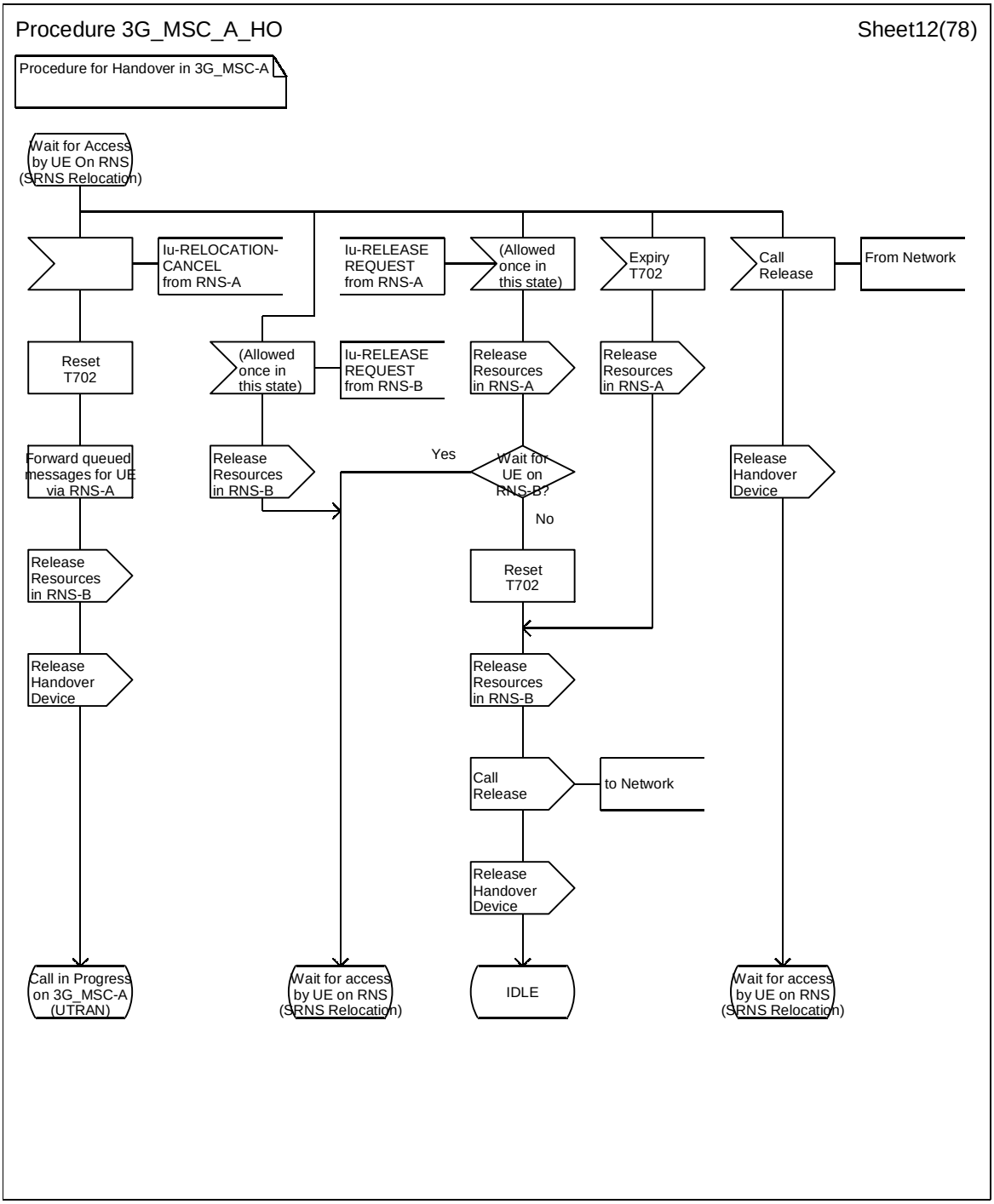

Procedure for Handover in 3G_MSC-A
Wait for access by UE/MS on BSS/RNS (UMTS to GSM handover)
A-HANDOVER-COMPLETE from BSS-B
A-HANDOVER-DETECT from BSS-B
Connect the Handover Device (Option)
Only if not already connected
Connect the Handover Device (Option)
Reset T302
Release Resources in RNS-A
Forward queued messages for UE/MS via BSS-B
Call in Progress on 3G_MSC-A (GSM)
Wait for access by UE/MS on BSS/RNS (UMTS to GSM Ho)

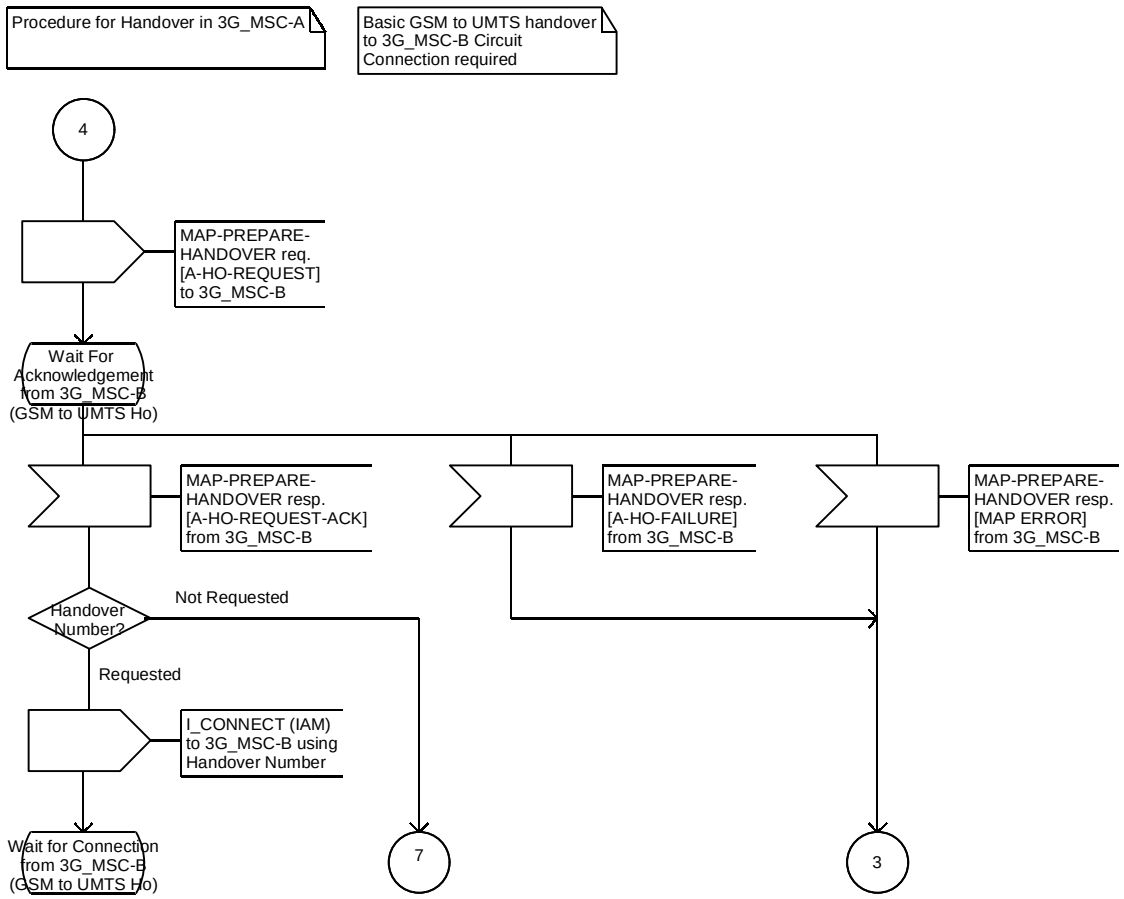

Procedure for Handover in 3G_MSC-A
Wait for Access by UE/MS On RNS/BSS (UMTS to GSM Ho)
Iu-RELOCATION-CANCEL from RNS-A
Iu-RELEASE REQUEST from RNS-A
(Allowed once in this state)
Expiry T302
Call Release
From Network
Reset T302
(Allowed once in this state)
A-CLEAR REQUEST from BSS-B
Release Resources in RNS-A
Release Resources in RNS-A
Release Handover Device
Forward queued messages for UE/MS via RNS-A
Release Resources in BSS-B
Yes
Wait for UE/MS on BSS-B?
No
Release Resources in BSS-B
Reset T302
Release Handover Device
Release Resources in BSS-B
Call Release
to Network
Release Handover Device
Call in Progress on 3G_MSC-A (UTRAN)
Wait for access by UE/MS on RNS/BSS (UMTS to GSM Ho)
IDLE
Wait for access by UE/MS on RNS/BSS (UMTS to GSM Ho)

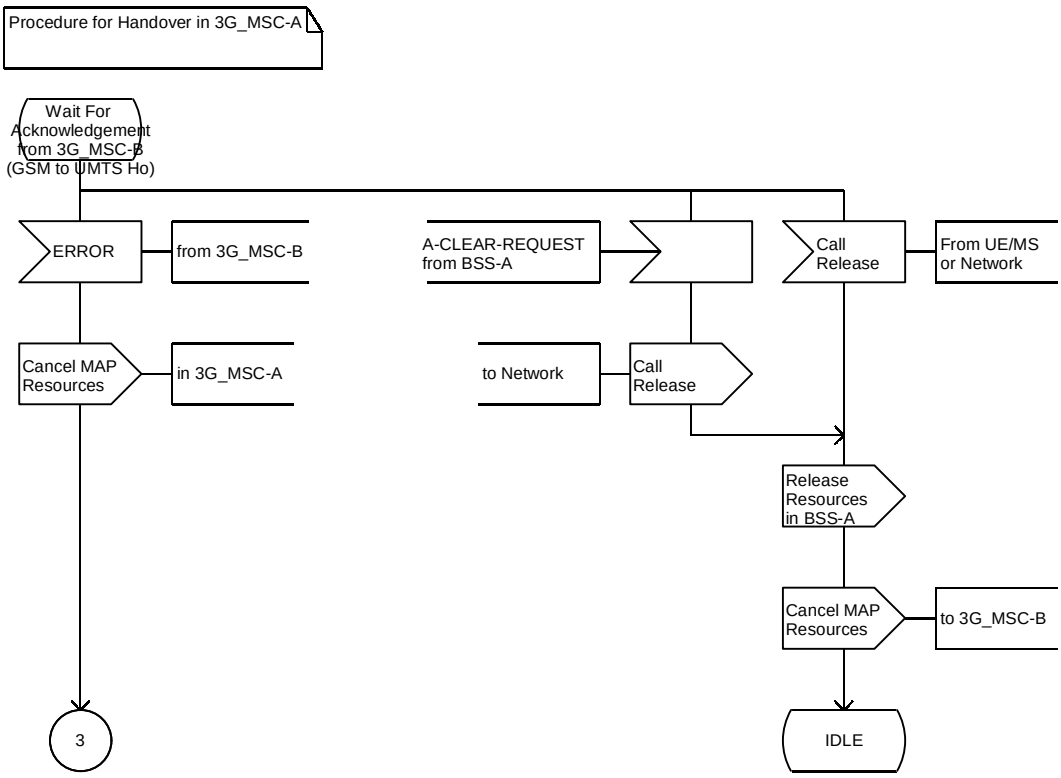

Procedure for Handover in 3G_MSC-A
11
Known 3G_MSC?
Yes
No
Which 3G_MSC?
3G_MSC-B
3G_MSC-A
Known RNS?
No
Yes
16
Resources on RNS-B?
No
Yes
Iu-RELOCATION PREPARATION FAILURE to RNS-A
Call in Progress on 3G_MSC-A (UTRAN)
15
17

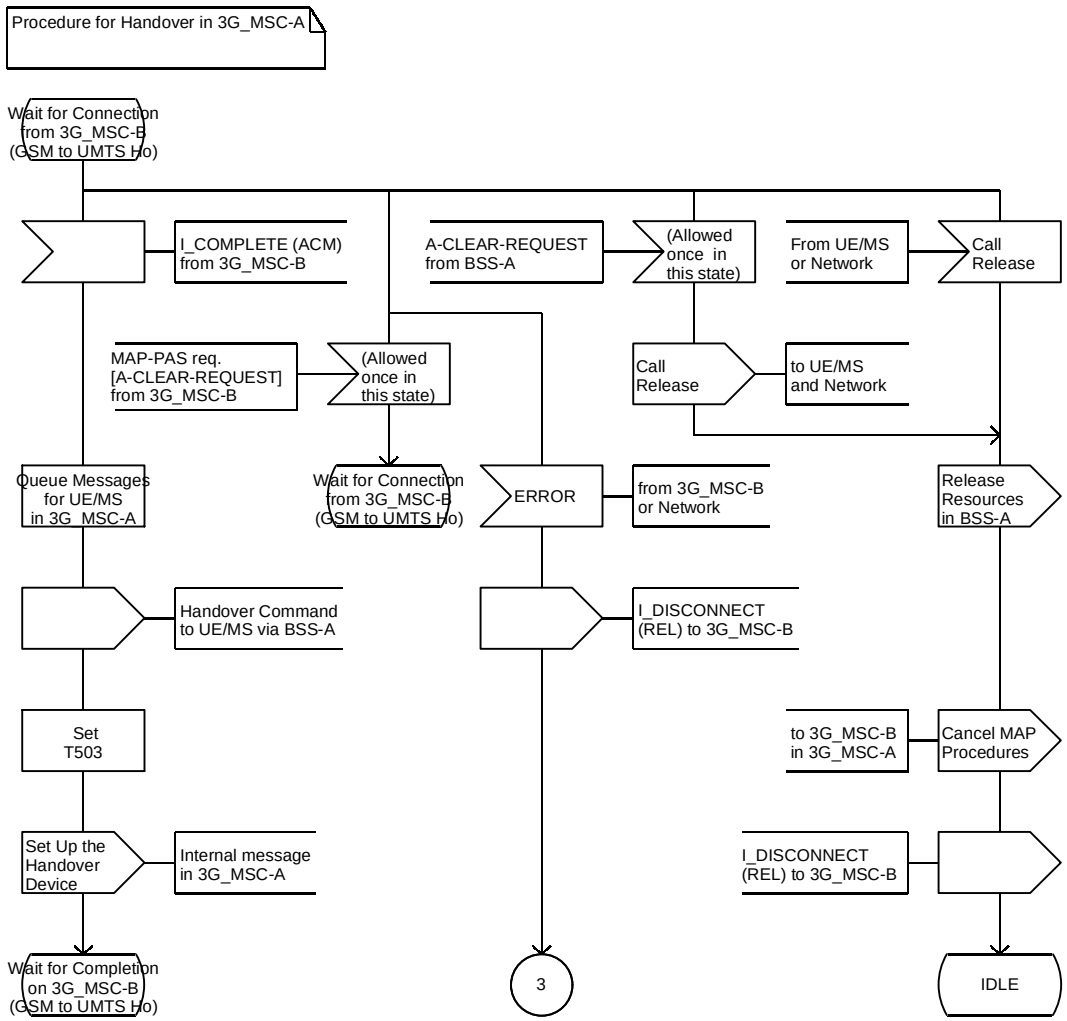

Procedure for Handover in 3G_MSC-A
SRNS Relocation on 3G_MSC-A from RNS-A to RNS-B
15
Iu-RELOCATION -REQUEST to RNS-B
Set T701
Wait for Channel Allocation Intra-3G_MSC
Iu-RELOCATION-REQUEST-ACK from RNS-B
Iu-RELOCATION FAILURE from RNS-B
From UE or Network
Call Release
Reset T701
Expiry T701
Reset T701
Iu-RELEASE-REQUEST from RNS-A
Queue Messages for UE in 3G_MSC-A
Call Release
to Network
Iu-RELOCATION Command to RNS-A
Cancel Channel in RNS-B
Release Resources in RNS-A
Set Up Handover Device
Internal message in 3G_MSC-A
Cancel Channel in RNS-B
Set T702
Wait for access by UE on RNS (SRNS Relocation)
16
IDLE

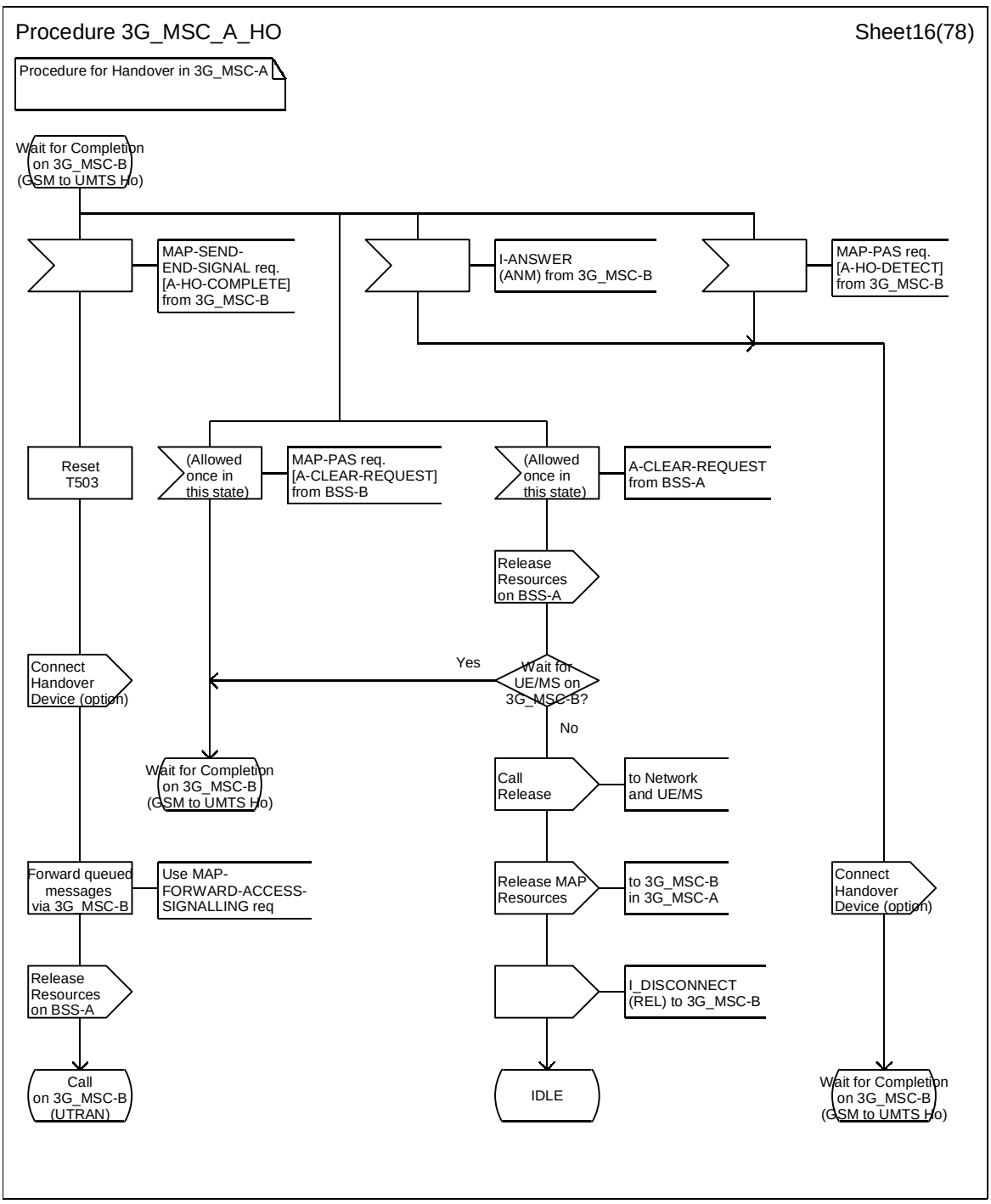

Procedure for Handover in 3G_MSC-A
Wait for access by UE on RNS (SRNS RELOCATION)
Iu-RELOCATION-COMPLETE from RNS-B
Iu-RELOCATION-DETECT from RNS-B
Connect the Handover Device (Option)
Only if not already connected
Connect the Handover Device (Option)
Reset T702
Release Resources in RNS-A
Forward queued messages for UE via RNS-B
Call in Progress on 3G_MSC-A (UTRAN)
Wait for access by UE on RNS (SRNS Relocation)

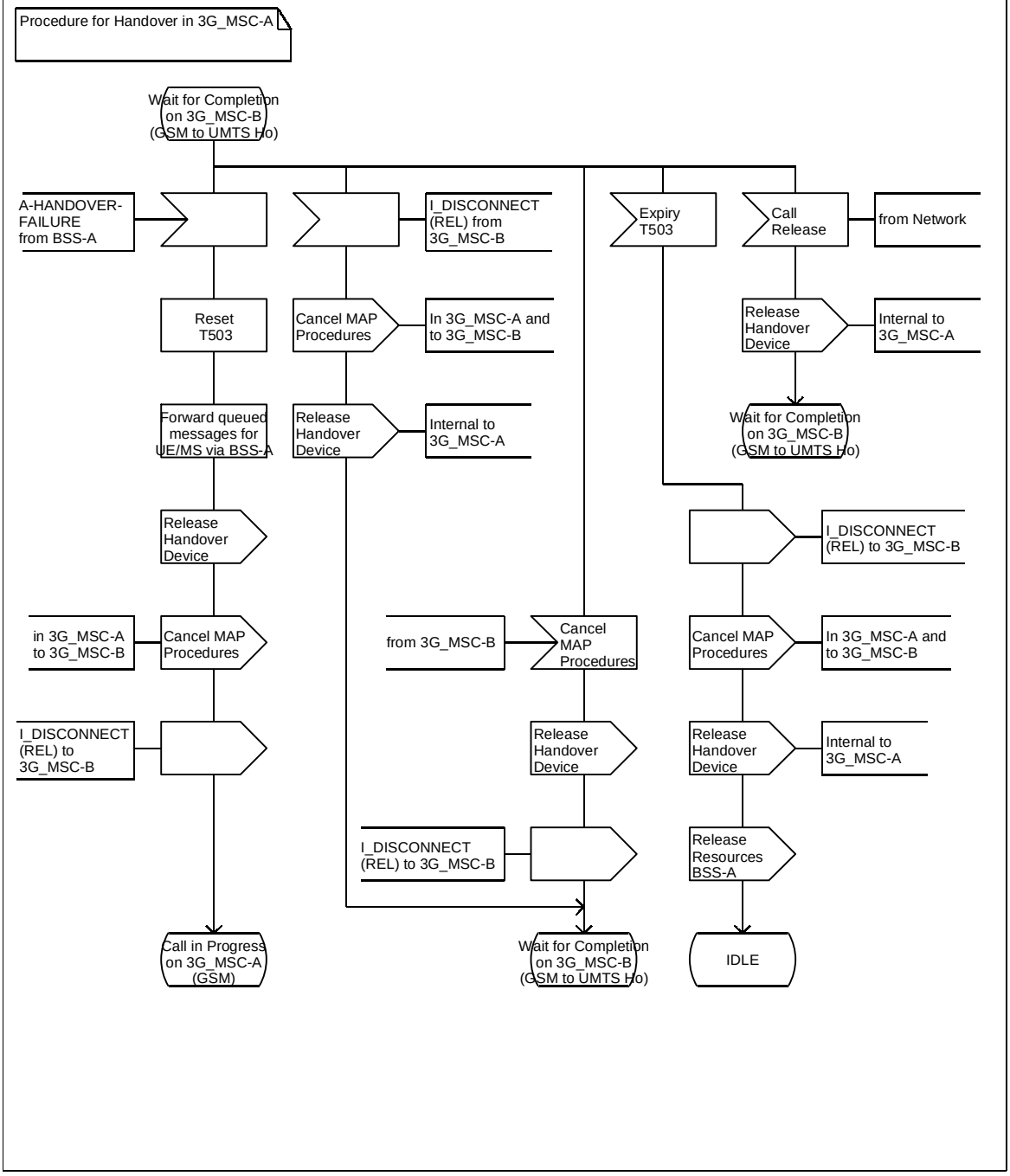

Procedure for Handover in 3G_MSC-A
Wait for Access by UE On RNS (SRNS Relocation)
Iu-RELOCATION-CANCEL from RNS-A
Iu-RELEASE REQUEST from RNS-A
(Allowed once in this state)
Expiry T702
Call Release
From Network
Reset T702
(Allowed once in this state)
Iu-RELEASE REQUEST from RNS-B
Release Resources in RNS-A
Release Resources in RNS-A
Forward queued messages for UE via RNS-A
Release Resources in RNS-B
Yes
Wait for UE on RNS-B?
Release Handover Device
No
Release Resources in RNS-B
Reset T702
Release Handover Device
Release Resources in RNS-B
Call Release
to Network
Release Handover Device
Call in Progress on 3G_MSC-A (UTRAN)
Wait for access by UE on RNS (SRNS Relocation)
IDLE
Wait for access by UE on RNS (SRNS Relocation)

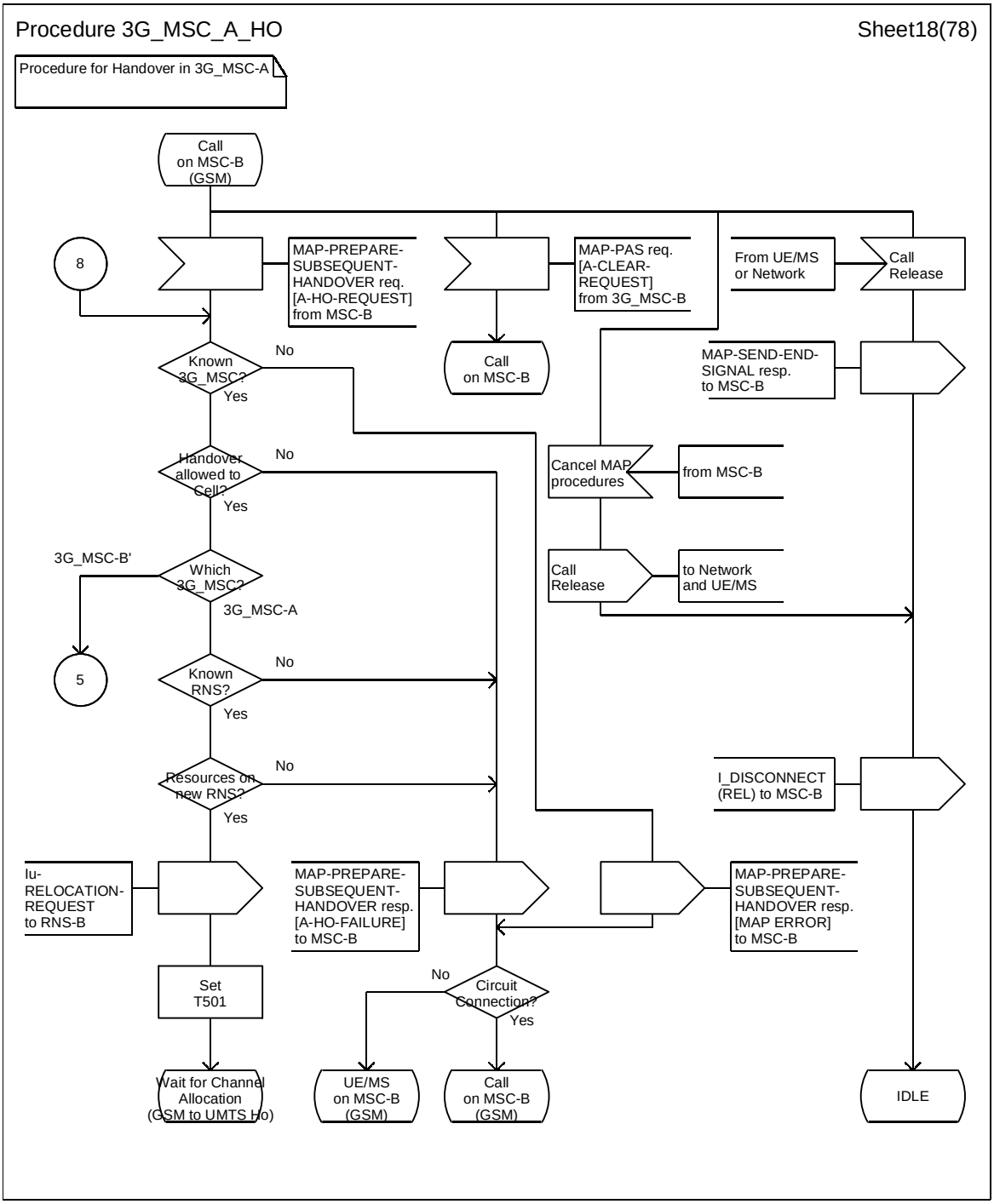

Procedure for Handover in 3G_MSC-A
Basic GSM to UMTS handover to 3G_MSC-B Circuit Connection required
4
MAP-PREPARE-HANDOVER req. [A-HO-REQUEST] to 3G_MSC-B
Wait For Acknowledgement from 3G_MSC-B (GSM to UMTS Ho)
MAP-PREPARE-HANDOVER resp. [A-HO-REQUEST-ACK] from 3G_MSC-B
MAP-PREPARE-HANDOVER resp. [A-HO-FAILURE] from 3G_MSC-B
MAP-PREPARE-HANDOVER resp. [MAP ERROR] from 3G_MSC-B
Handover Number?
Not Requested
Requested
I_CONNECT (IAM) to 3G_MSC-B using Handover Number
Wait for Connection from 3G_MSC-B (GSM to UMTS Ho)
7
3

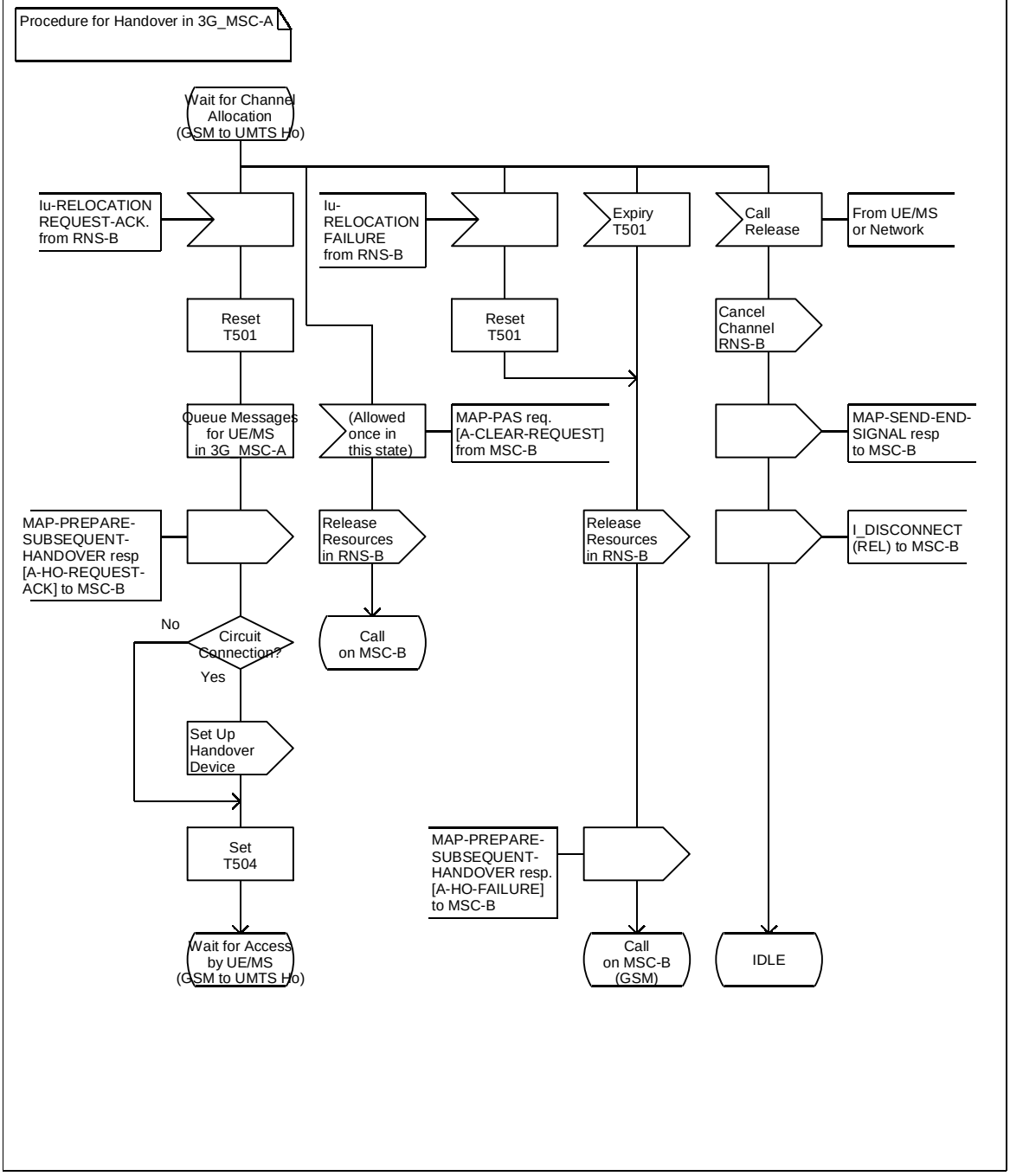

Procedure for Handover in 3G_MSC-A
Wait For Acknowledgement from 3G_MSC-B (GSM to UMTS Ho)
ERROR
from 3G_MSC-B
A-CLEAR-REQUEST from BSS-A
Call Release
From UE/MS or Network
Cancel MAP Resources
in 3G_MSC-A
to Network
Call Release
Release Resources in BSS-A
Cancel MAP Resources
to 3G_MSC-B
3
IDLE

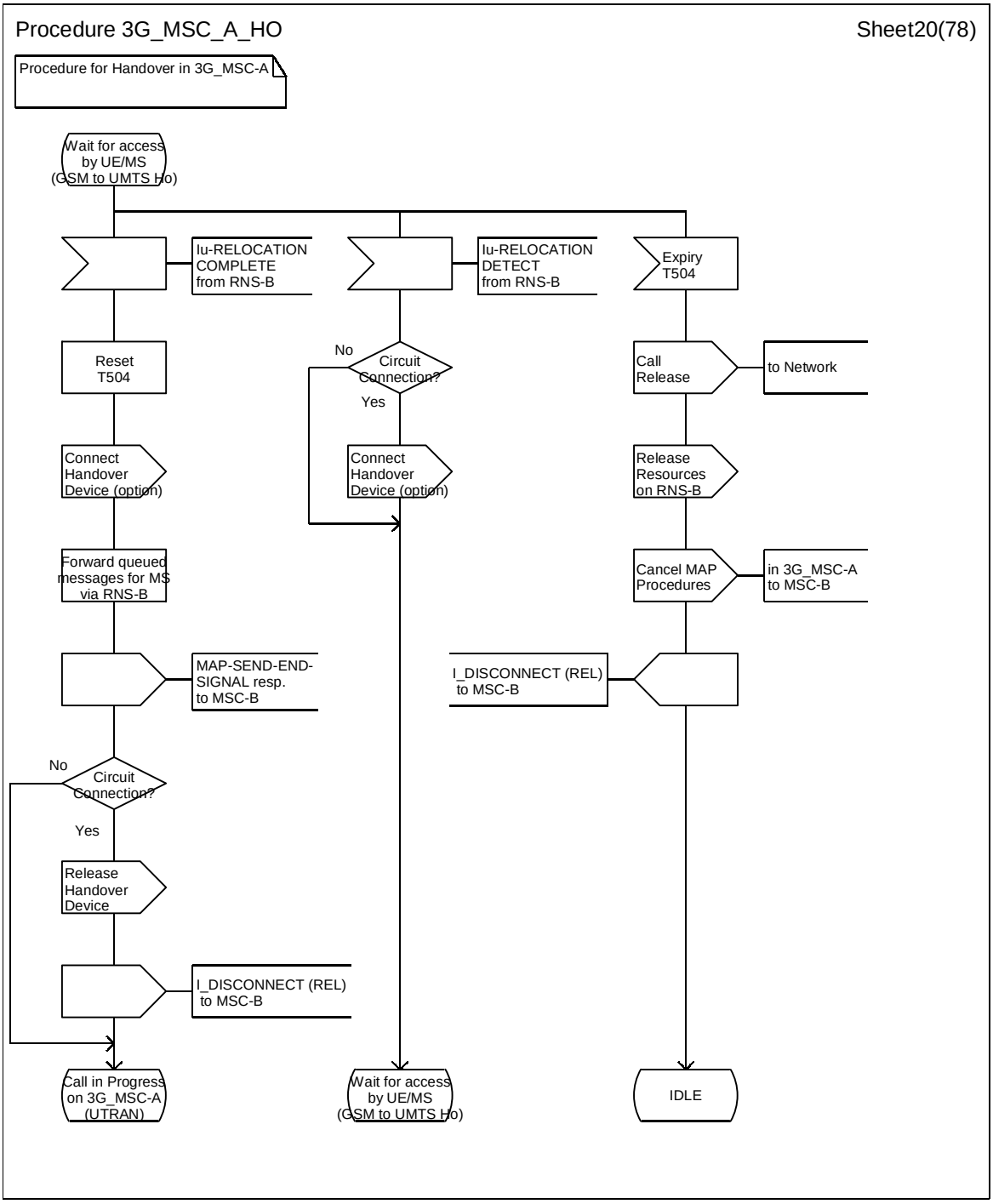

Procedure for Handover in 3G_MSC-A
Wait for Connection from 3G_MSC-B (GSM to UMTS Ho)
I_COMPLETE (ACM) from 3G_MSC-B
A-CLEAR-REQUEST from BSS-A
(Allowed once in this state)
From UE/MS or Network
Call Release
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Call Release
to UE/MS and Network
Queue Messages for UE/MS in 3G_MSC-A
Wait for Connection from 3G_MSC-B (GSM to UMTS Ho)
ERROR
from 3G_MSC-B or Network
Release Resources in BSS-A
Handover Command to UE/MS via BSS-A
I_DISCONNECT (REL) to 3G_MSC-B
Set T503
to 3G_MSC-B in 3G_MSC-A
Cancel MAP Procedures
Set Up the Handover Device
Internal message in 3G_MSC-A
I_DISCONNECT (REL) to 3G_MSC-B
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)
3
IDLE

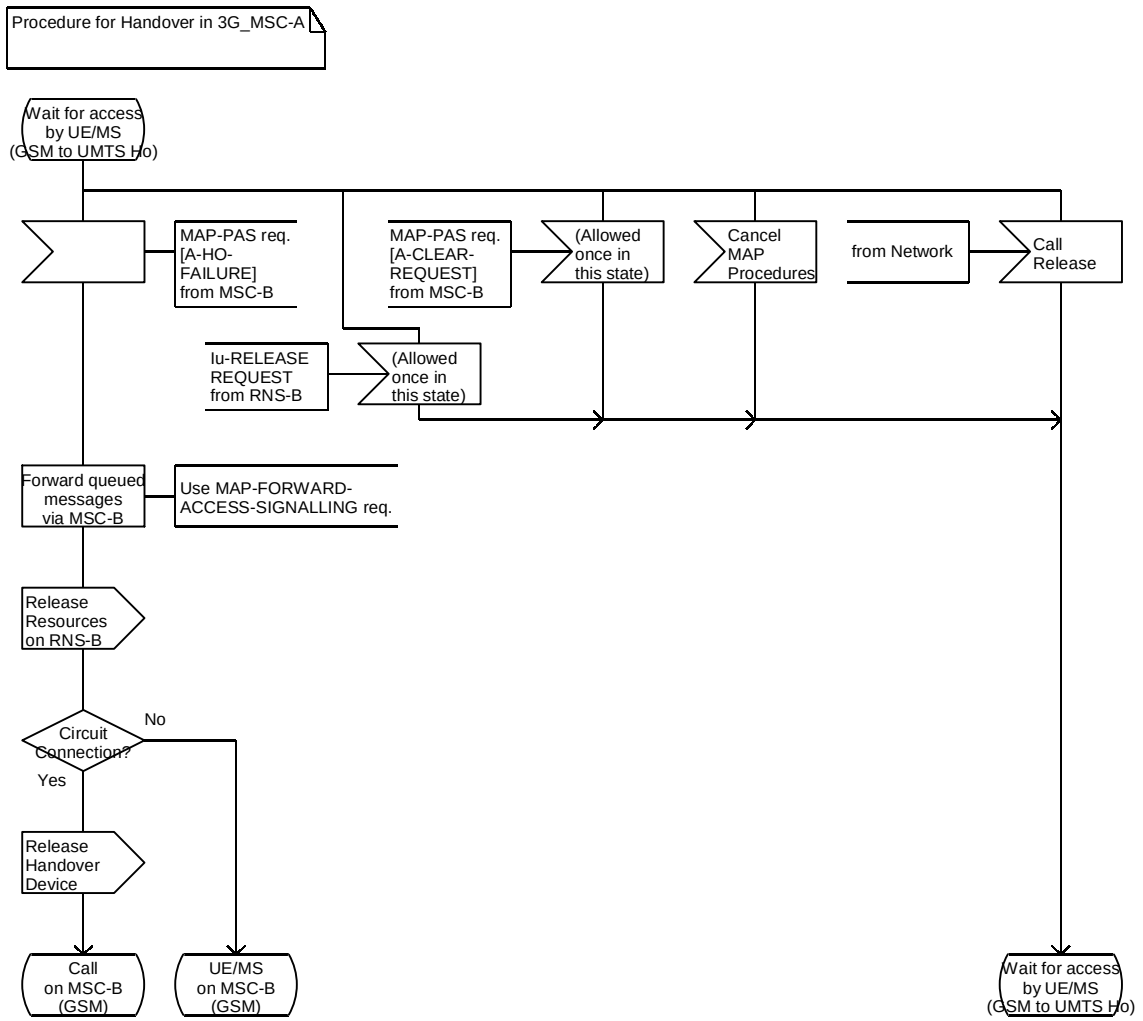

Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] from 3G_MSC-B
I-ANSWER (ANM) from 3G_MSC-B
MAP-PAS req. [A-HO-DETECT] from 3G_MSC-B
Reset T503
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from BSS-B
(Allowed once in this state)
A-CLEAR-REQUEST from BSS-A
Release Resources on BSS-A
Connect Handover Device (option)
Yes
Wait for UE/MS on 3G_MSC-B?
No
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)
Call Release
to Network and UE/MS
Forward queued messages via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req
Release MAP Resources
to 3G_MSC-B in 3G_MSC-A
Connect Handover Device (option)
Release Resources on BSS-A
I_DISCONNECT (REL) to 3G_MSC-B
Call on 3G_MSC-B (UTRAN)
IDLE
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)

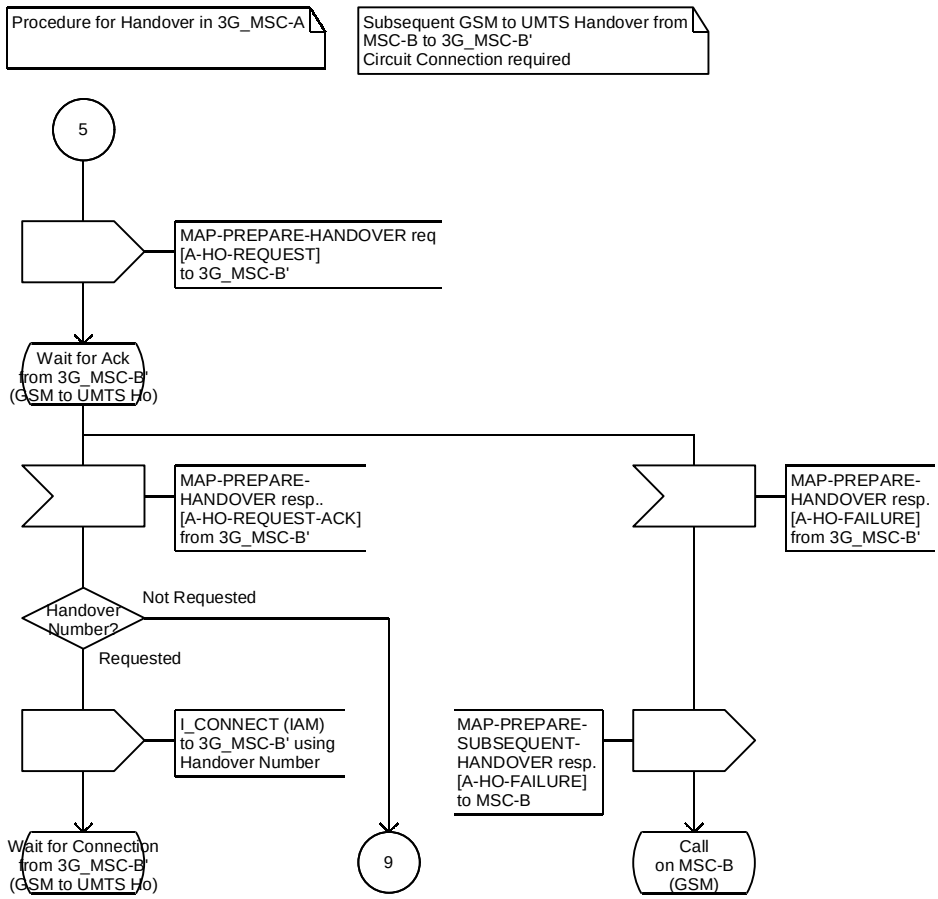

Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)
A-HANDOVER-FAILURE from BSS-A
I_DISCONNECT (REL) from 3G_MSC-B
Expiry T503
Call Release
from Network
Reset T503
Cancel MAP Procedures
In 3G_MSC-A and to 3G_MSC-B
Release Handover Device
Internal to 3G_MSC-A
Forward queued messages for UE/MS via BSS-A
Release Handover Device
Internal to 3G_MSC-A
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-B
in 3G_MSC-A to 3G_MSC-B
Cancel MAP Procedures
from 3G_MSC-B
Cancel MAP Procedures
Cancel MAP Procedures
In 3G_MSC-A and to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B
Release Handover Device
Release Handover Device
Internal to 3G_MSC-A
I_DISCONNECT (REL) to 3G_MSC-B
Release Resources BSS-A
Call in Progress on 3G_MSC-A (GSM)
Wait for Completion on 3G_MSC-B (GSM to UMTS Ho)
IDLE

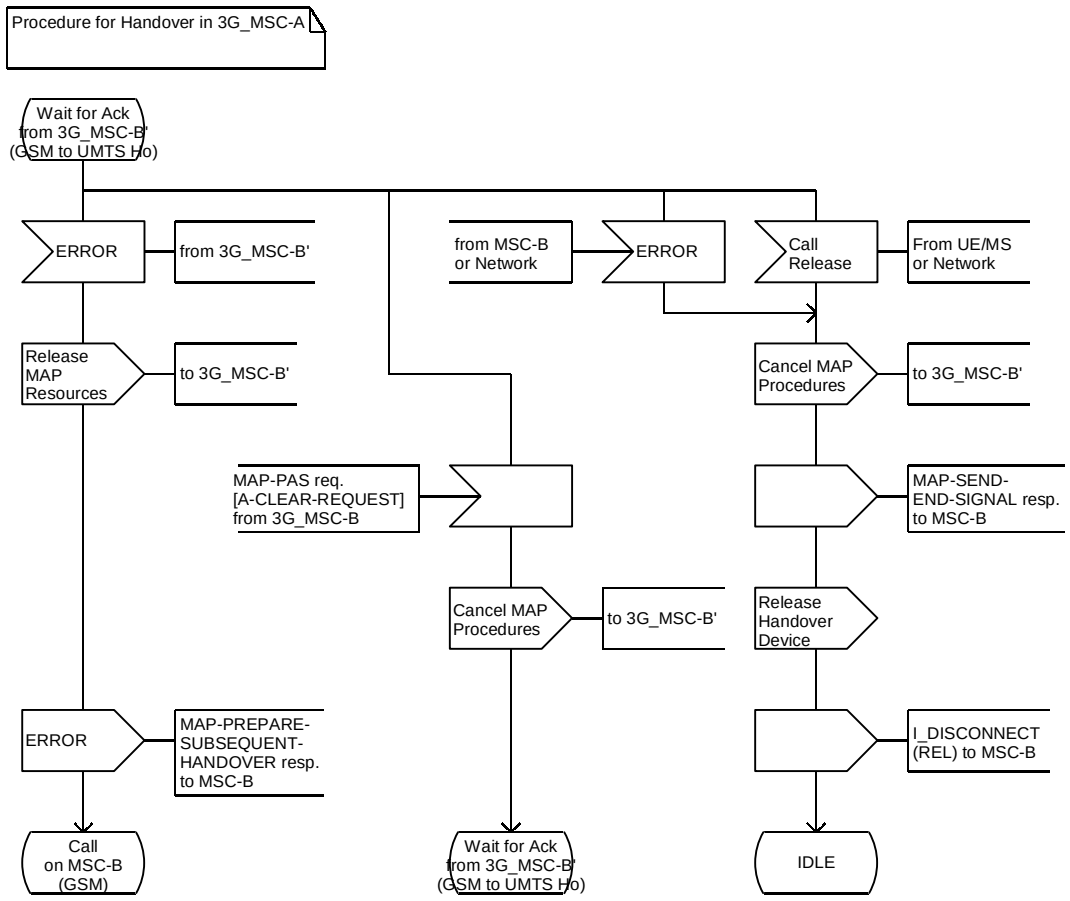

Procedure for Handover in 3G_MSC-A
Call on MSC-B (GSM)
8
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [A-HO-REQUEST] from MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
From UE/MS or Network
Call Release
Known 3G_MSC?
No
Yes
Call on MSC-B
MAP-SEND-END-SIGNAL resp. to MSC-B
Handover allowed to Cell?
No
Yes
Cancel MAP procedures
from MSC-B
3G_MSC-B'
Which 3G_MSC?
Call Release
to Network and UE/MS
3G_MSC-A
5
Known RNS?
No
Yes
Resources on new RNS?
No
Yes
I_DISCONNECT (REL) to MSC-B
Iu-RELOCATION-REQUEST to RNS-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE] to MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [MAP ERROR] to MSC-B
Set T501
No
Circuit Connection?
Yes
Wait for Channel Allocation (GSM to UMTS Ho)
UE/MS on MSC-B (GSM)
Call on MSC-B (GSM)
IDLE

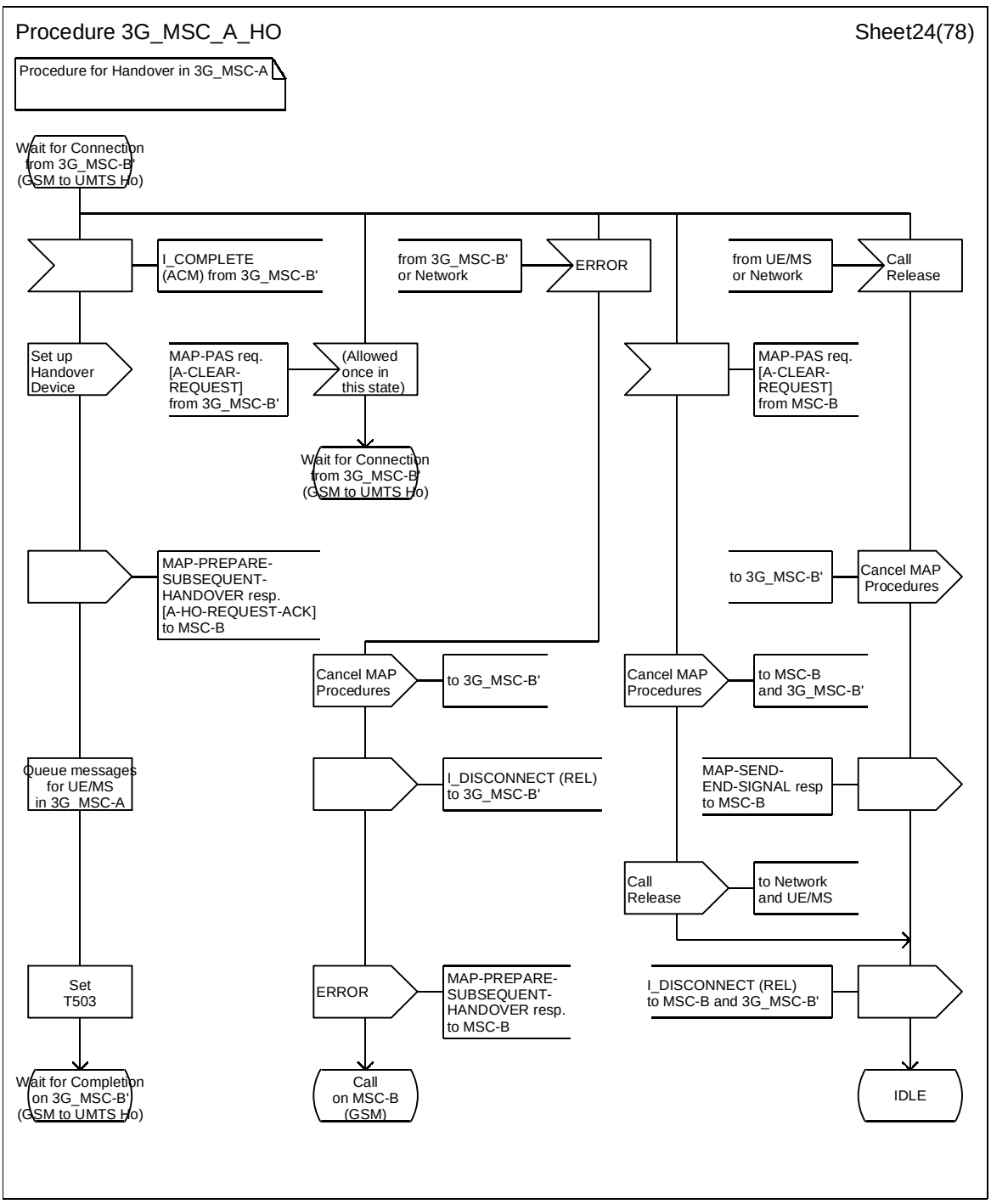

Procedure for Handover in 3G_MSC-A
Wait for Channel Allocation (GSM to UMTS Ho)
Iu-RELOCATION REQUEST-ACK. from RNS-B
Iu-RELOCATION FAILURE from RNS-B
Expiry T501
Call Release
From UE/MS or Network
Reset T501
Reset T501
Cancel Channel RNS-B
Queue Messages for UE/MS in 3G_MSC-A
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
MAP-SEND-END-SIGNAL resp to MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp [A-HO-REQUEST-ACK] to MSC-B
Release Resources in RNS-B
Release Resources in RNS-B
I_DISCONNECT (REL) to MSC-B
No
Circuit Connection?
Call on MSC-B
Yes
Set Up Handover Device
Set T504
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE] to MSC-B
Wait for Access by UE/MS (GSM to UMTS Ho)
Call on MSC-B (GSM)
IDLE

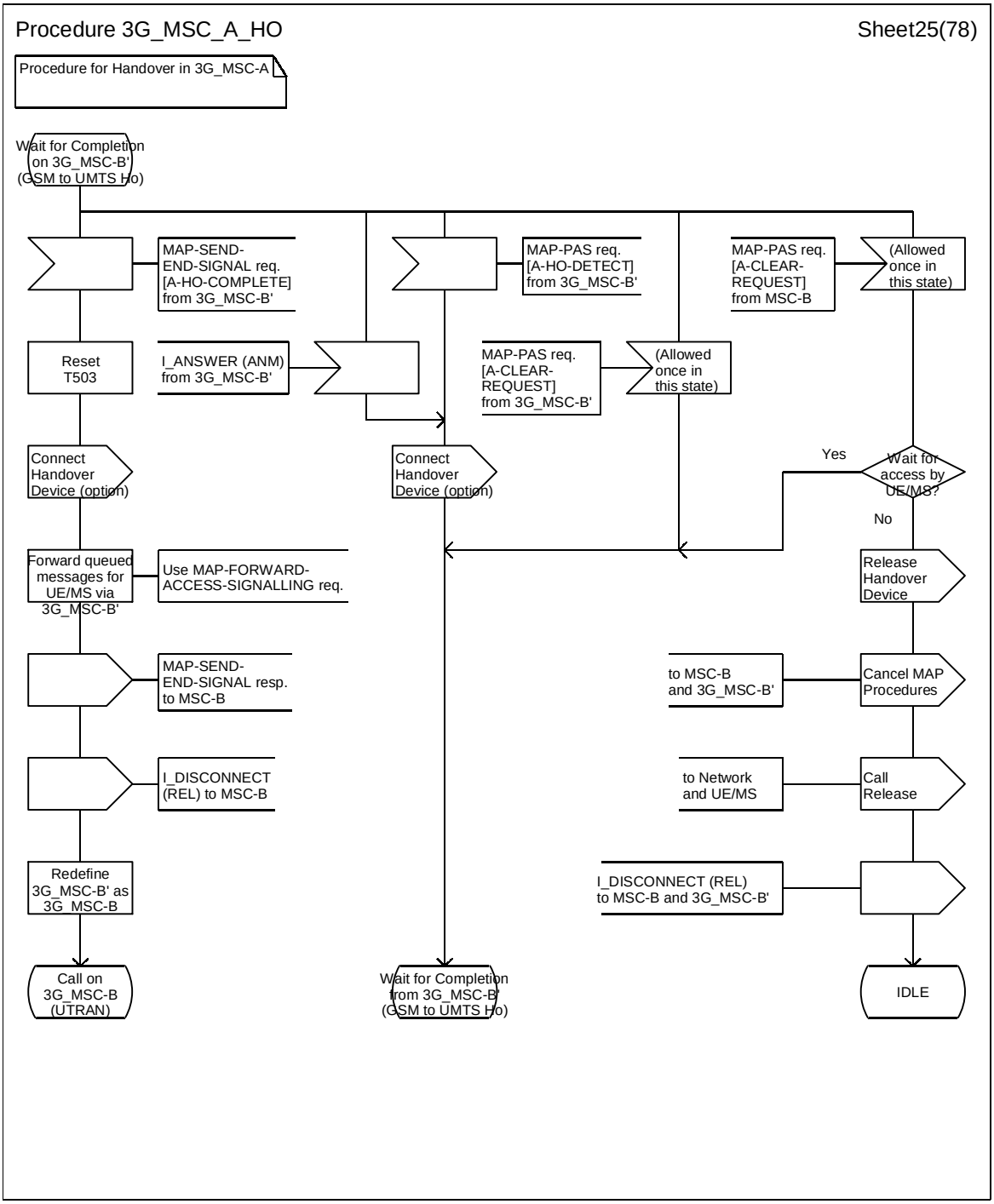

Procedure for Handover in 3G_MSC-A
Wait for access by UE/MS (GSM to UMTS Ho)
Iu-RELOCATION COMPLETE from RNS-B
Iu-RELOCATION DETECT from RNS-B
Expiry T504
Reset T504
No
Circuit Connection?
Yes
Call Release
to Network
Connect Handover Device (option)
Connect Handover Device (option)
Release Resources on RNS-B
Forward queued messages for MS via RNS-B
Cancel MAP Procedures
in 3G_MSC-A to MSC-B
MAP-SEND-END-SIGNAL resp. to MSC-B
I_DISCONNECT (REL) to MSC-B
No
Circuit Connection?
Yes
Release Handover Device
I_DISCONNECT (REL) to MSC-B
Call in Progress on 3G_MSC-A (UTRAN)
Wait for access by UE/MS (GSM to UMTS Ho)
IDLE

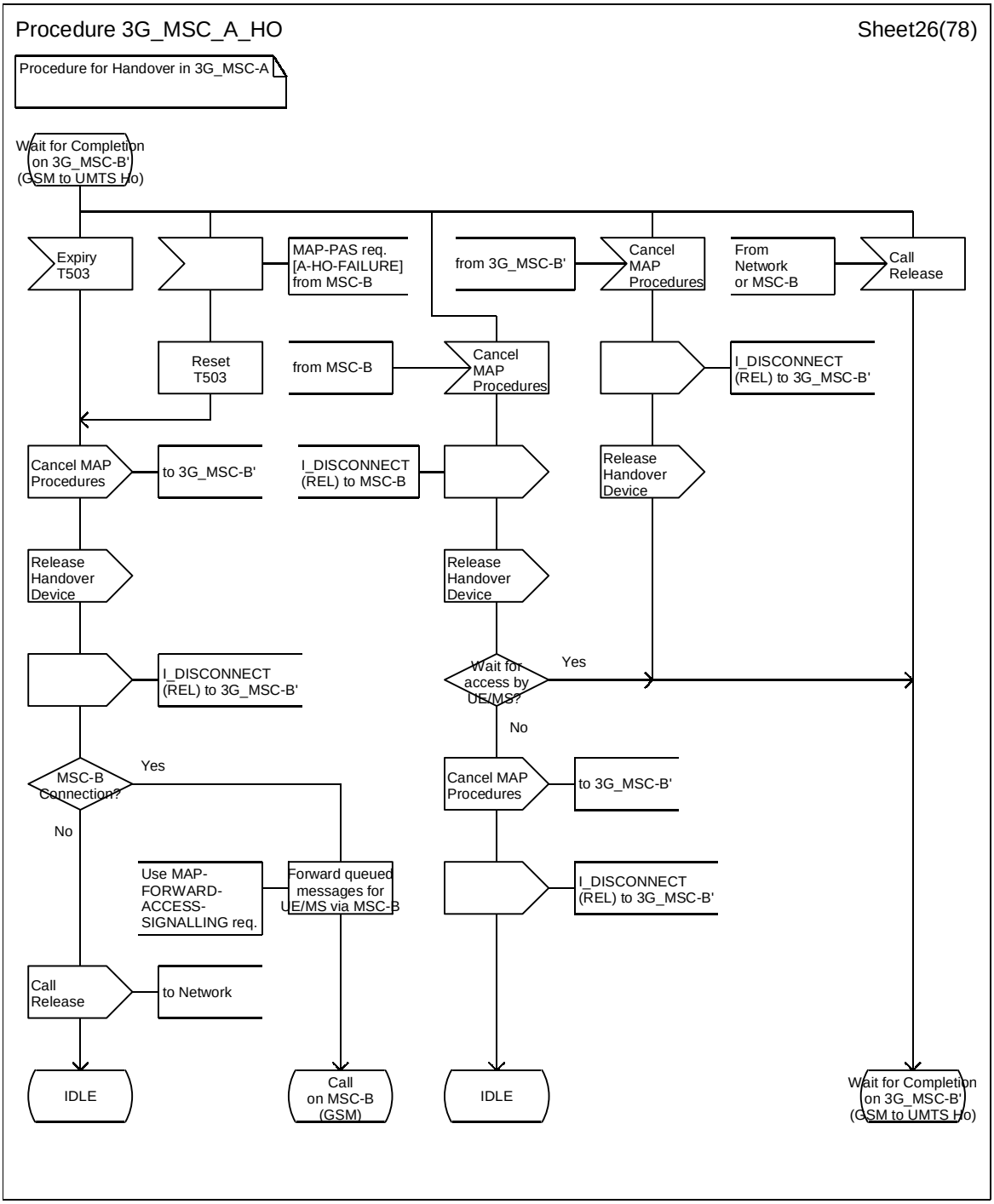

Procedure for Handover in 3G_MSC-A
Wait for access by UE/MS (GSM to UMTS Ho)
MAP-PAS req. [A-HO-FAILURE] from MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Cancel MAP Procedures
from Network
Call Release
Iu-RELEASE REQUEST from RNS-B
(Allowed once in this state)
Forward queued messages via MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release Resources on RNS-B
Circuit Connection?
No
Yes
Release Handover Device
Call on MSC-B (GSM)
UE/MS on MSC-B (GSM)
Wait for access by UE/MS (GSM to UMTS Ho)

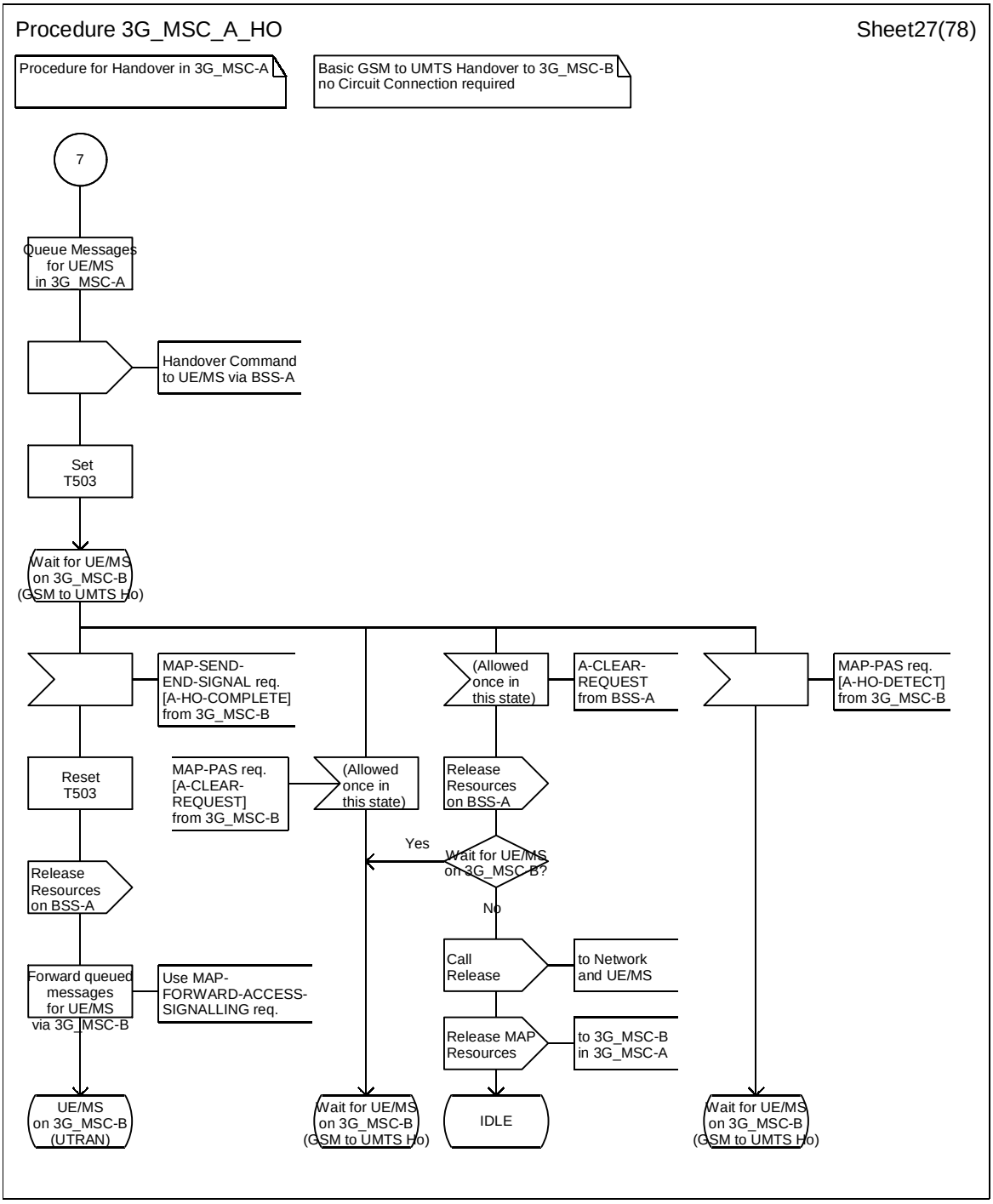

Procedure for Handover in 3G_MSC-A
Subsequent GSM to UMTS Handover from MSC-B to 3G_MSC-B' Circuit Connection required
5
MAP-PREPARE-HANDOVER req [A-HO-REQUEST] to 3G_MSC-B'
Wait for Ack from 3G_MSC-B' (GSM to UMTS Ho)
MAP-PREPARE-HANDOVER resp.. [A-HO-REQUEST-ACK] from 3G_MSC-B'
MAP-PREPARE-HANDOVER resp. [A-HO-FAILURE] from 3G_MSC-B'
Handover Number?
Not Requested
Requested
I_CONNECT (IAM) to 3G_MSC-B' using Handover Number
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE] to MSC-B
Wait for Connection from 3G_MSC-B' (GSM to UMTS Ho)
9
Call on MSC-B (GSM)

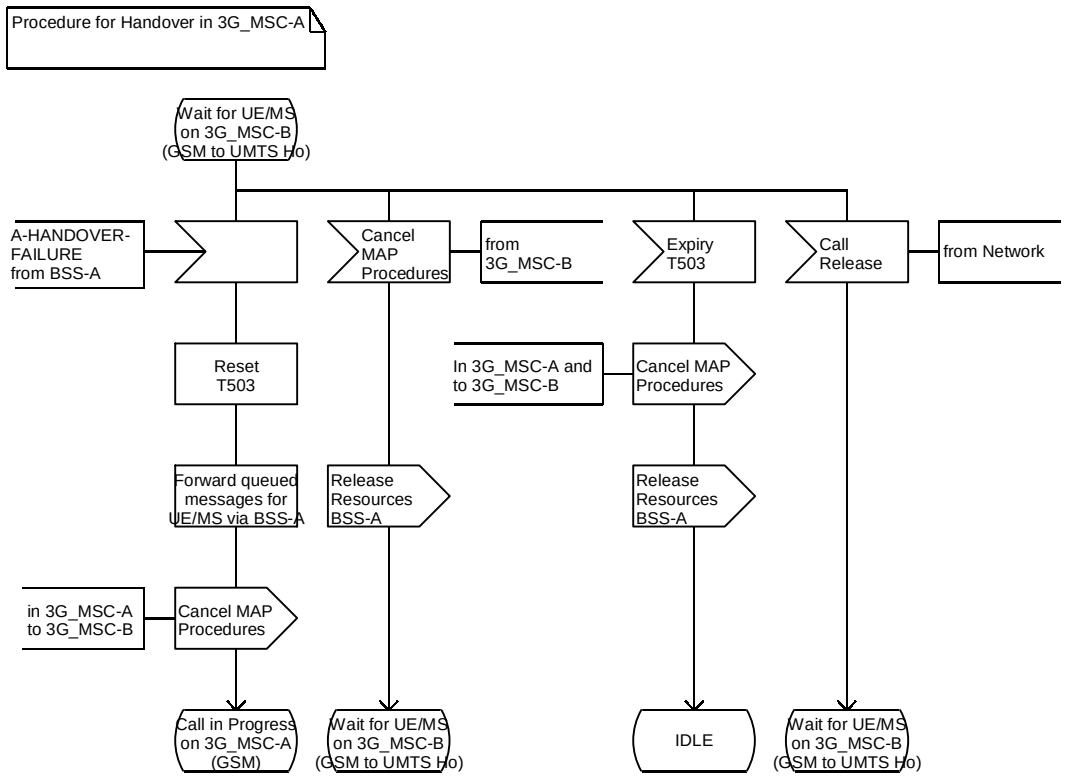

Procedure for Handover in 3G_MSC-A
Wait for Ack from 3G_MSC-B' (GSM to UMTS Ho)
ERROR
from 3G_MSC-B'
from MSC-B or Network
ERROR
Call Release
From UE/MS or Network
Release MAP Resources
to 3G_MSC-B'
Cancel MAP Procedures
to 3G_MSC-B'
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to MSC-B
Cancel MAP Procedures
to 3G_MSC-B'
Release Handover Device
ERROR
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. to MSC-B
I_DISCONNECT (REL) to MSC-B
Call on MSC-B (GSM)
Wait for Ack from 3G_MSC-B' (GSM to UMTS Ho)
IDLE

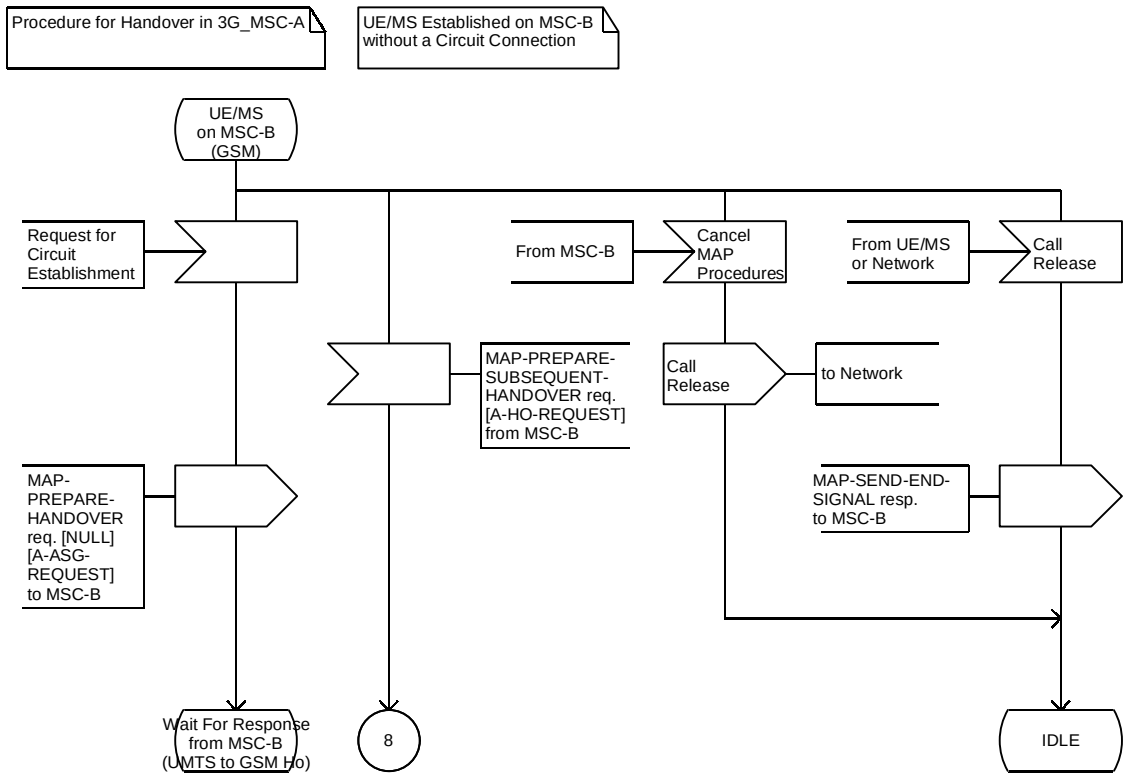

Procedure for Handover in 3G_MSC-A
Wait for Connection from 3G_MSC-B' (GSM to UMTS Ho)
I_COMPLETE (ACM) from 3G_MSC-B'
from 3G_MSC-B' or Network
ERROR
from UE/MS or Network
Call Release
Set up Handover Device
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B'
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
Wait for Connection from 3G_MSC-B' (GSM to UMTS Ho)
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-REQUEST-ACK] to MSC-B
to 3G_MSC-B'
Cancel MAP Procedures
Cancel MAP Procedures
to 3G_MSC-B'
Cancel MAP Procedures
to MSC-B and 3G_MSC-B'
Queue messages for UE/MS in 3G_MSC-A
I_DISCONNECT (REL) to 3G_MSC-B'
MAP-SEND-END-SIGNAL resp to MSC-B
Call Release
to Network and UE/MS
Set T503
ERROR
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. to MSC-B
I_DISCONNECT (REL) to MSC-B and 3G_MSC-B'
Wait for Completion on 3G_MSC-B' (GSM to UMTS Ho)
Call on MSC-B (GSM)
IDLE


Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B' (GSM to UMTS Ho)
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] from 3G_MSC-B'
MAP-PAS req. [A-HO-DETECT] from 3G_MSC-B'
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Reset T503
I_ANSWER (ANM) from 3G_MSC-B'
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B'
(Allowed once in this state)
Yes
Wait for access by UE/MS?
No
Connect Handover Device (option)
Connect Handover Device (option)
Forward queued messages for UE/MS via 3G_MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release Handover Device
MAP-SEND-END-SIGNAL resp. to MSC-B
to MSC-B and 3G_MSC-B'
Cancel MAP Procedures
I_DISCONNECT (REL) to MSC-B
to Network and UE/MS
Call Release
Redefine 3G_MSC-B' as 3G_MSC-B
I_DISCONNECT (REL) to MSC-B and 3G_MSC-B'
Call on 3G_MSC-B (UTRAN)
Wait for Completion from 3G_MSC-B' (GSM to UMTS Ho)
IDLE


Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B' (GSM to UMTS Ho)
Expiry T503
MAP-PAS req. [A-HO-FAILURE] from MSC-B
from 3G_MSC-B'
Cancel MAP Procedures
From Network or MSC-B
Call Release
Reset T503
from MSC-B
Cancel MAP Procedures
I_DISCONNECT (REL) to 3G_MSC-B'
Cancel MAP Procedures
to 3G_MSC-B'
I_DISCONNECT (REL) to MSC-B
Release Handover Device
Release Handover Device
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-B'
Wait for access by UE/MS?
Yes
No
MSC-B Connection?
Yes
No
Cancel MAP Procedures
to 3G_MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Forward queued messages for UE/MS via MSC-B
I_DISCONNECT (REL) to 3G_MSC-B'
Call Release
to Network
IDLE
Call on MSC-B (GSM)
IDLE
Wait for Completion on 3G_MSC-B' (GSM to UMTS Ho)

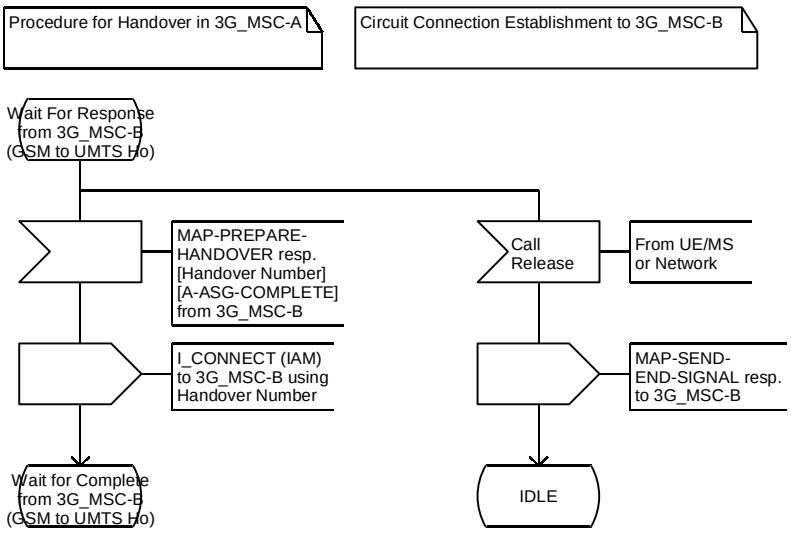

Procedure for Handover in 3G_MSC-A
Basic GSM to UMTS Handover to 3G_MSC-B
no Circuit Connection required
7
Queue Messages for UE/MS in 3G_MSC-A
Handover Command to UE/MS via BSS-A
Set T503
Wait for UE/MS on 3G_MSC-B (GSM to UMTS Ho)
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] from 3G_MSC-B
(Allowed once in this state)
A-CLEAR-REQUEST from BSS-A
MAP-PAS req. [A-HO-DETECT] from 3G_MSC-B
Reset T503
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Release Resources on BSS-A
Yes
Wait for UE/MS on 3G_MSC-B?
Release Resources on BSS-A
No
Call Release
to Network and UE/MS
Forward queued messages for UE/MS via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release MAP Resources
to 3G_MSC-B in 3G_MSC-A
UE/MS on 3G_MSC-B (UTRAN)
Wait for UE/MS on 3G_MSC-B (GSM to UMTS Ho)
IDLE
Wait for UE/MS on 3G_MSC-B (GSM to UMTS Ho)

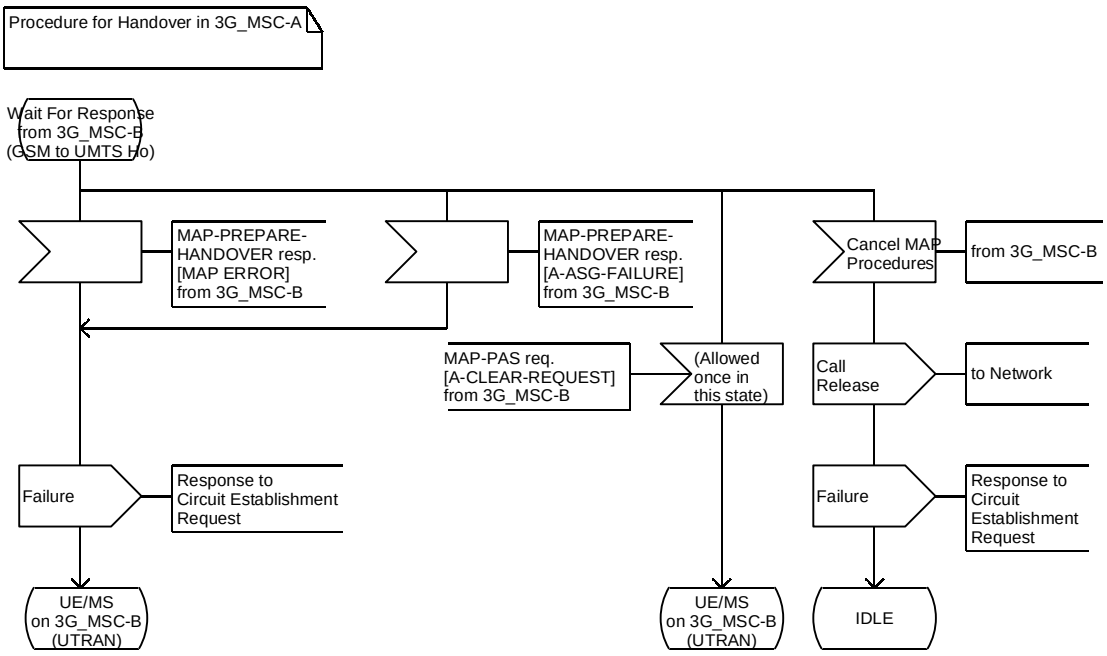

Procedure for Handover in 3G_MSC-A
Wait for UE/MS on 3G_MSC-B (GSM to UMTS Ho)
A-HANDOVER-FAILURE from BSS-A
Cancel MAP Procedures
from 3G_MSC-B
Expiry T503
Call Release
from Network
Reset T503
In 3G_MSC-A and to 3G_MSC-B
Cancel MAP Procedures
Forward queued messages for UE/MS via BSS-A
Release Resources BSS-A
Release Resources BSS-A
in 3G_MSC-A to 3G_MSC-B
Cancel MAP Procedures
Call in Progress on 3G_MSC-A (GSM)
Wait for UE/MS on 3G_MSC-B (GSM to UMTS Ho)
IDLE
Wait for UE/MS on 3G_MSC-B (GSM to UMTS Ho)

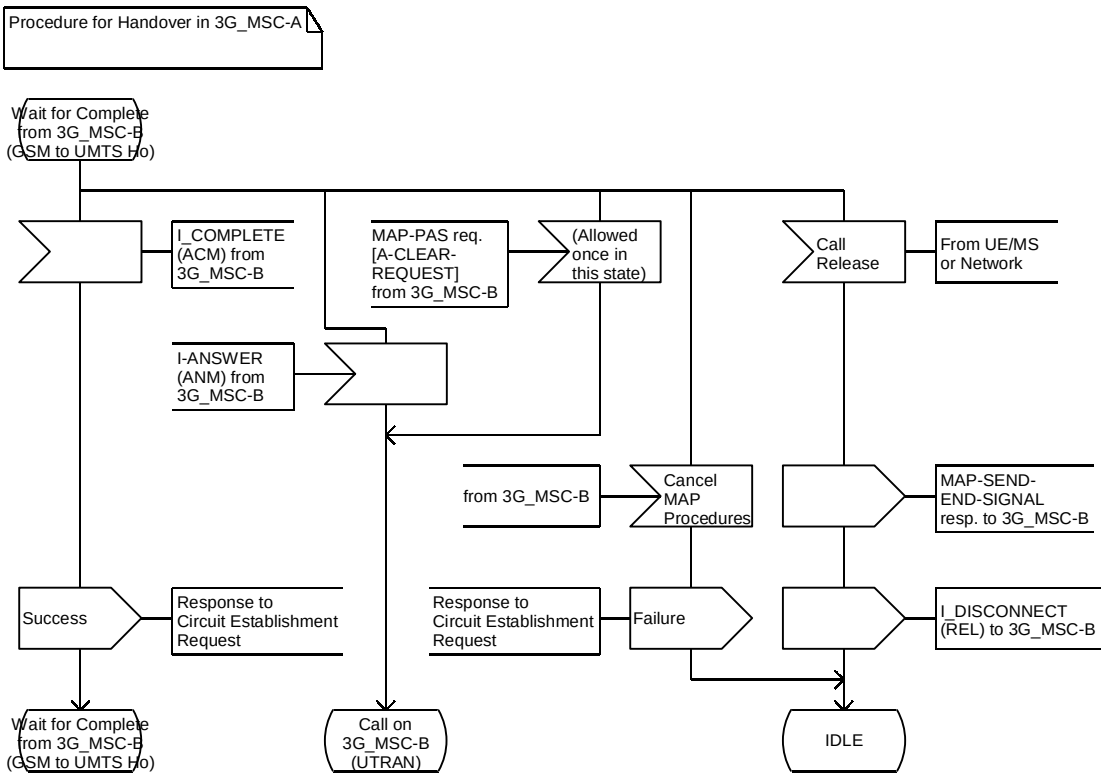

Procedure for Handover in 3G_MSC-A
UE/MS Established on MSC-B without a Circuit Connection
UE/MS on MSC-B (GSM)
Request for Circuit Establishment
From MSC-B
Cancel MAP Procedures
From UE/MS or Network
Call Release
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [A-HO-REQUEST] from MSC-B
Call Release
to Network
MAP-PREPARE-HANDOVER req. [NULL] [A-ASG-REQUEST] to MSC-B
MAP-SEND-END-SIGNAL resp. to MSC-B
Wait For Response from MSC-B (UMTS to GSM Ho)
8
IDLE

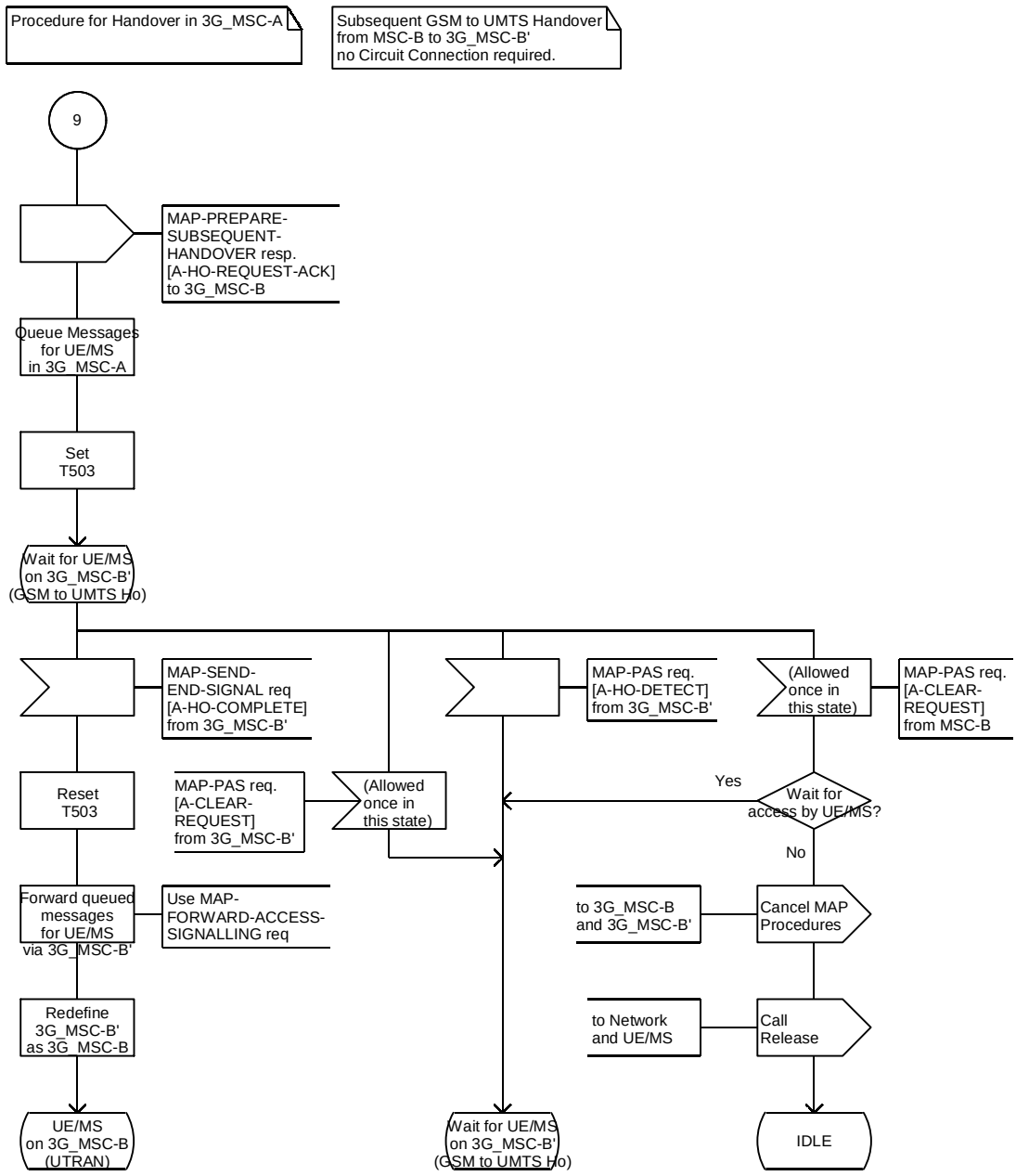
Procedure 3G_MSC_A_HO

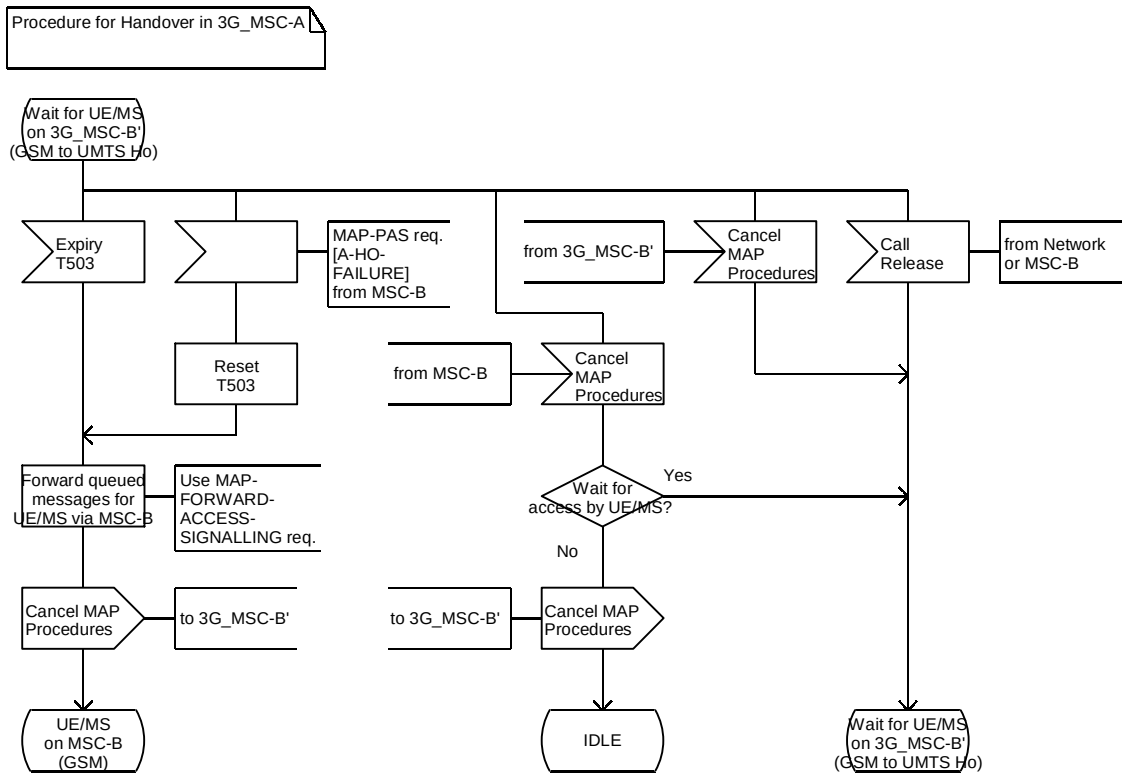
Sheet30(78)

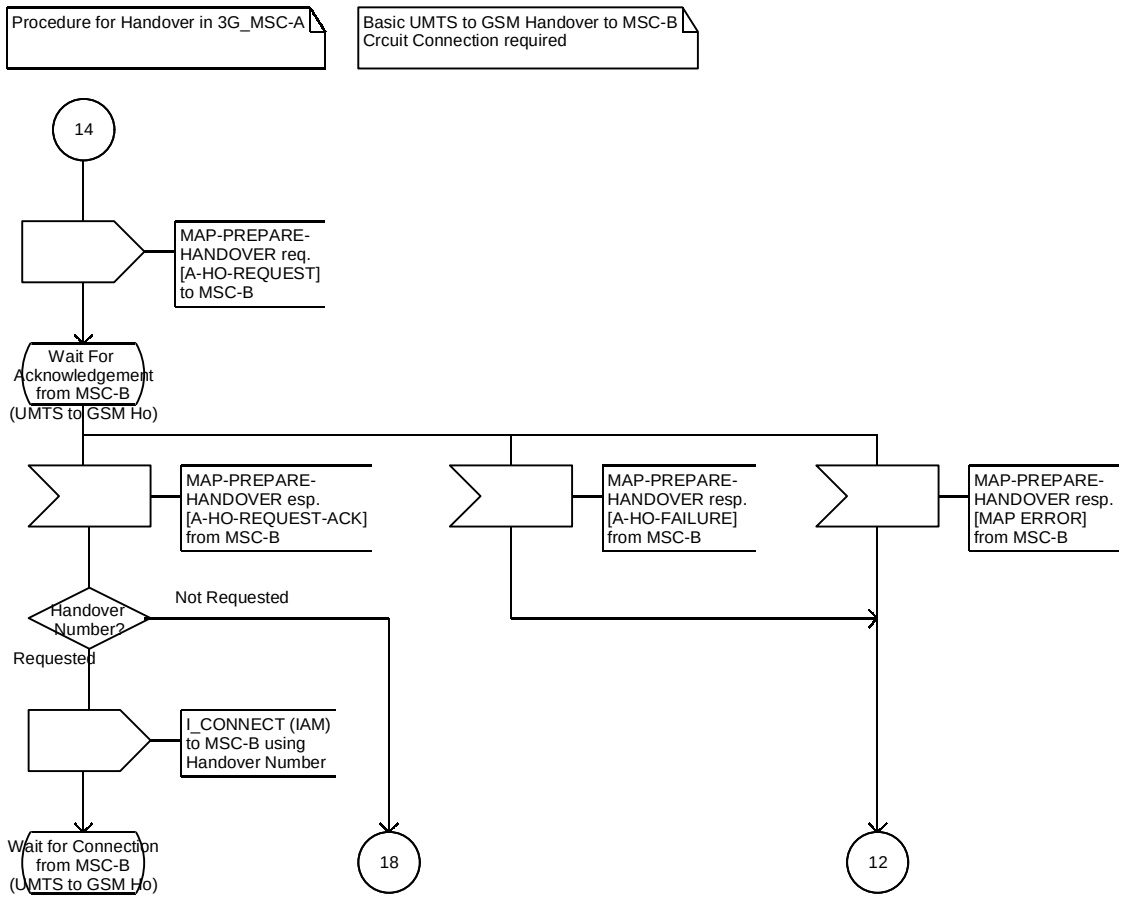


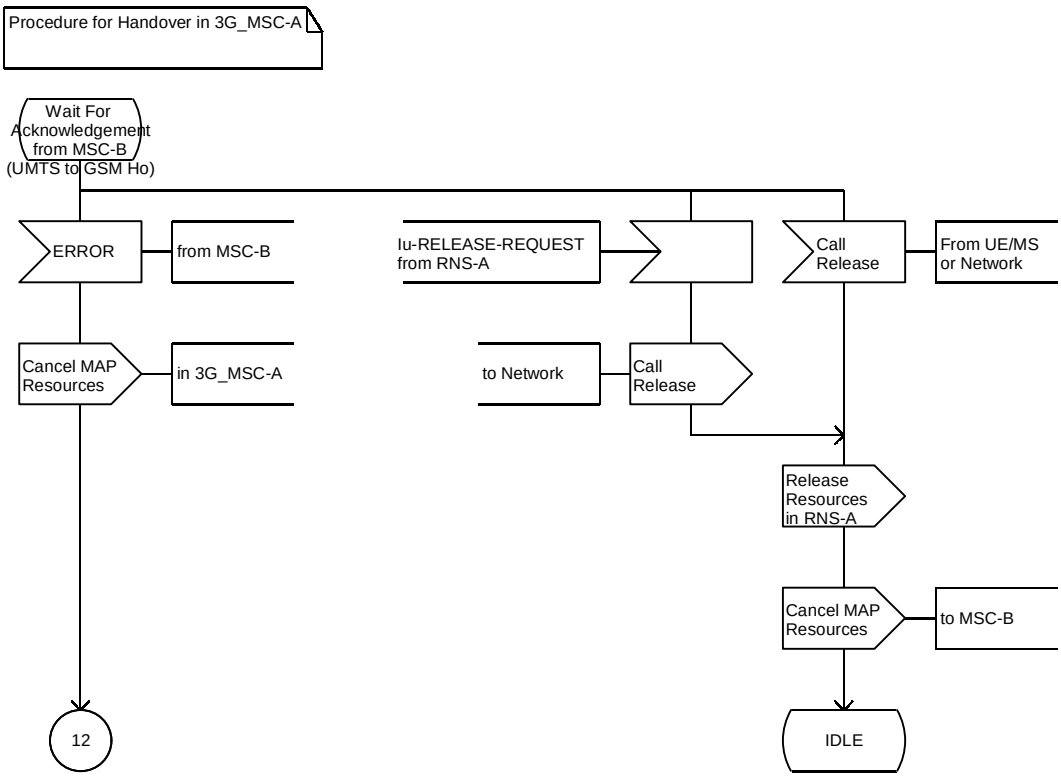

Procedure for Handover in 3G_MSC-A
Wait For Response from 3G_MSC-B (GSM to UMTS Ho)
MAP-PREPARE-HANDOVER resp. [MAP ERROR] from 3G_MSC-B
MAP-PREPARE-HANDOVER resp. [A-ASG-FAILURE] from 3G_MSC-B
Cancel MAP Procedures
from 3G_MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Call Release
to Network
Failure
Response to Circuit Establishment Request
Failure
Response to Circuit Establishment Request
UE/MS on 3G_MSC-B (UTRAN)
UE/MS on 3G_MSC-B (UTRAN)
IDLE

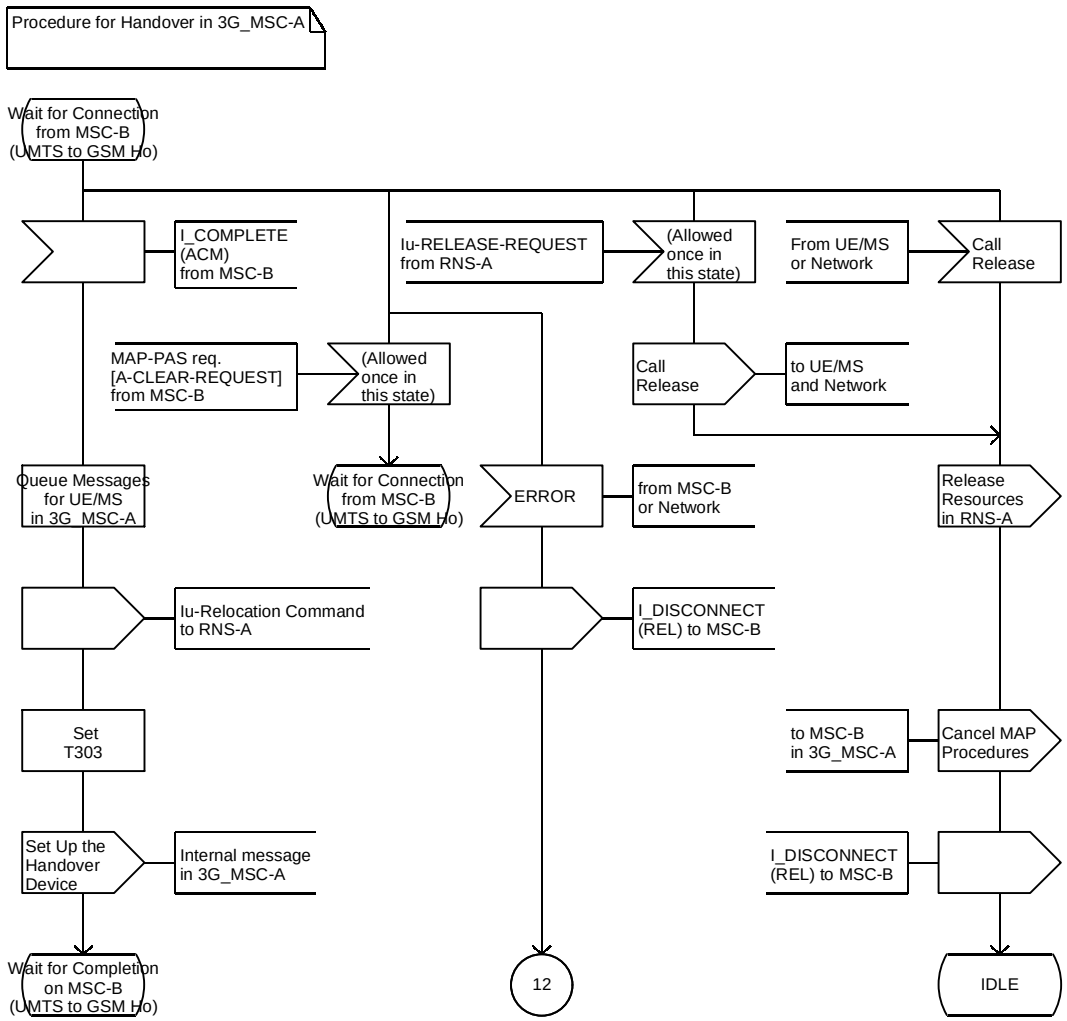

Procedure for Handover in 3G_MSC-A
Wait for Complete from 3G_MSC-B (GSM to UMTS Ho)
I_COMPLETE (ACM) from 3G_MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Call Release
From UE/MS or Network
I-ANSWER (ANM) from 3G_MSC-B
from 3G_MSC-B
Cancel MAP Procedures
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Success
Response to Circuit Establishment Request
Response to Circuit Establishment Request
Failure
I_DISCONNECT (REL) to 3G_MSC-B
Wait for Complete from 3G_MSC-B (GSM to UMTS Ho)
Call on 3G_MSC-B (UTRAN)
IDLE

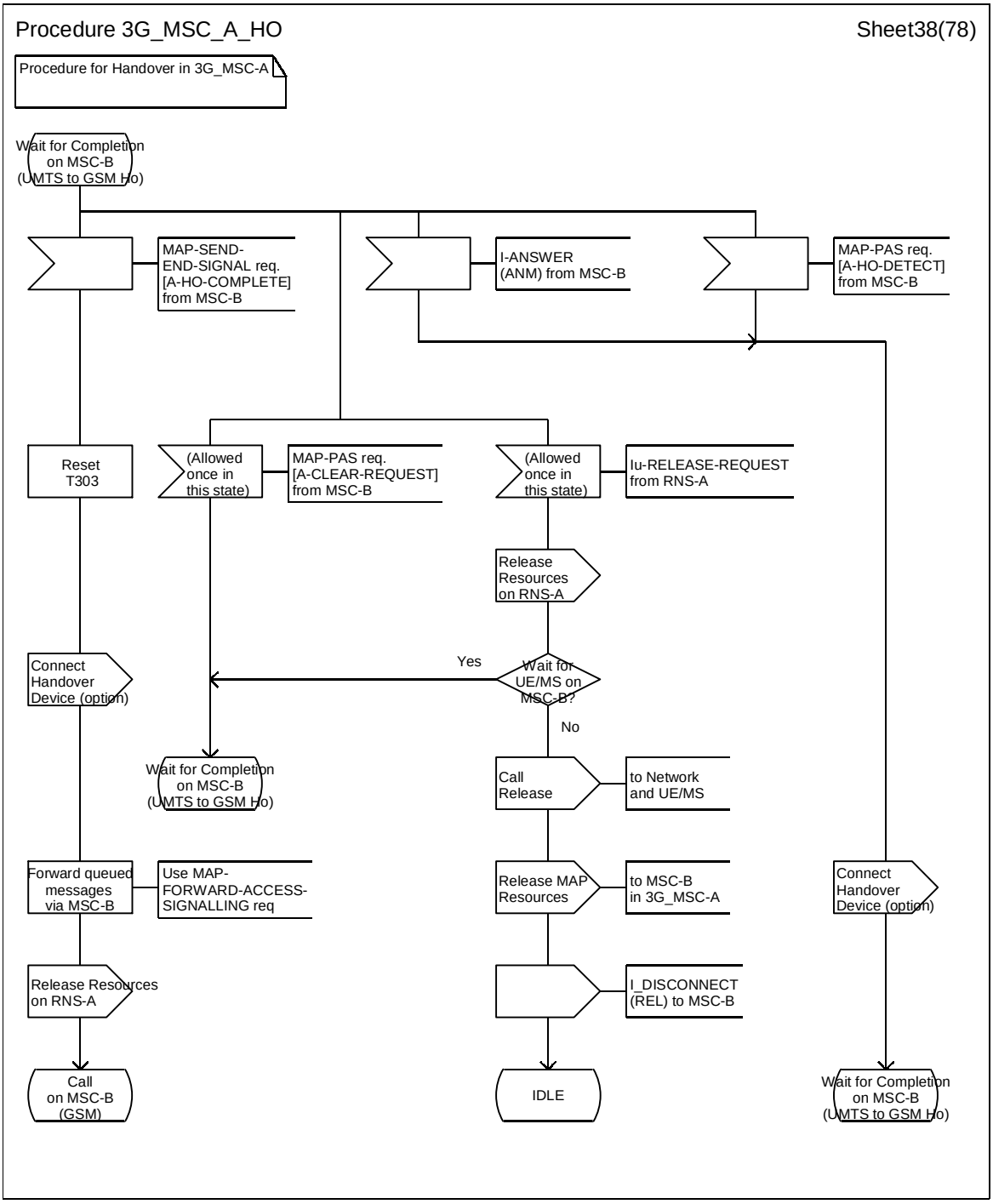

Procedure for Handover in 3G_MSC-A
Subsequent GSM to UMTS Handover from MSC-B to 3G_MSC-B' no Circuit Connection required.
9
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-REQUEST-ACK] to 3G_MSC-B
Queue Messages for UE/MS in 3G_MSC-A
Set T503
Wait for UE/MS on 3G_MSC-B' (GSM to UMTS Ho)
MAP-SEND-END-SIGNAL req [A-HO-COMPLETE] from 3G_MSC-B'
MAP-PAS req. [A-HO-DETECT] from 3G_MSC-B'
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
Reset T503
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B'
(Allowed once in this state)
Yes
Wait for access by UE/MS?
No
Forward queued messages for UE/MS via 3G_MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req
to 3G_MSC-B and 3G_MSC-B'
Cancel MAP Procedures
Redefine 3G_MSC-B' as 3G_MSC-B
to Network and UE/MS
Call Release
UE/MS on 3G_MSC-B (UTRAN)
Wait for UE/MS on 3G_MSC-B' (GSM to UMTS Ho)
IDLE

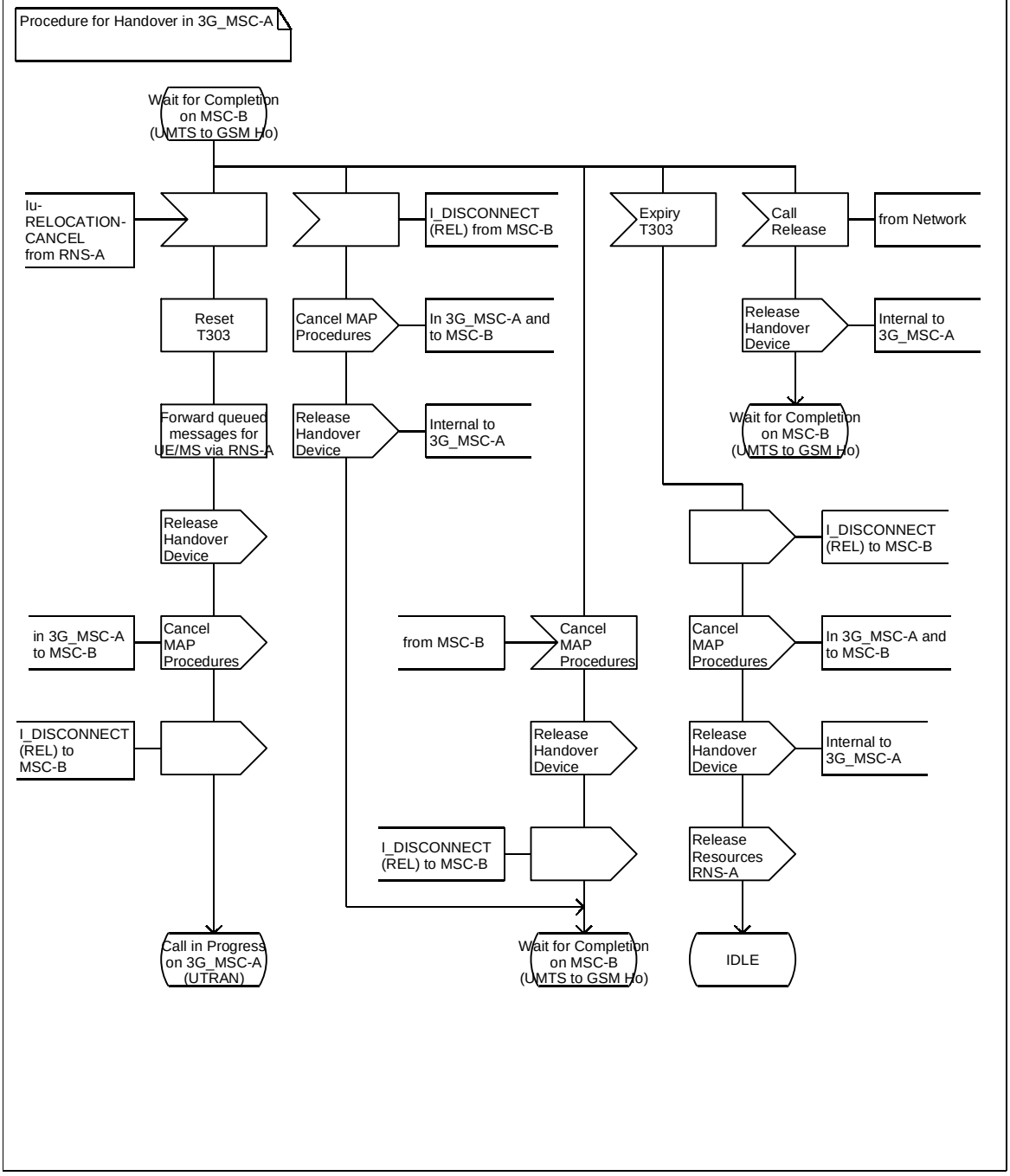

Procedure for Handover in 3G_MSC-A
Wait for UE/MS on 3G_MSC-B' (GSM to UMTS Ho)
Expiry T503
MAP-PAS req. [A-HO-FAILURE] from MSC-B
from 3G_MSC-B'
Cancel MAP Procedures
Call Release
from Network or MSC-B
Reset T503
from MSC-B
Cancel MAP Procedures
Forward queued messages for UE/MS via MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Wait for access by UE/MS?
Yes
No
Cancel MAP Procedures
to 3G_MSC-B'
to 3G_MSC-B'
Cancel MAP Procedures
UE/MS on MSC-B (GSM)
IDLE
Wait for UE/MS on 3G_MSC-B' (GSM to UMTS Ho)

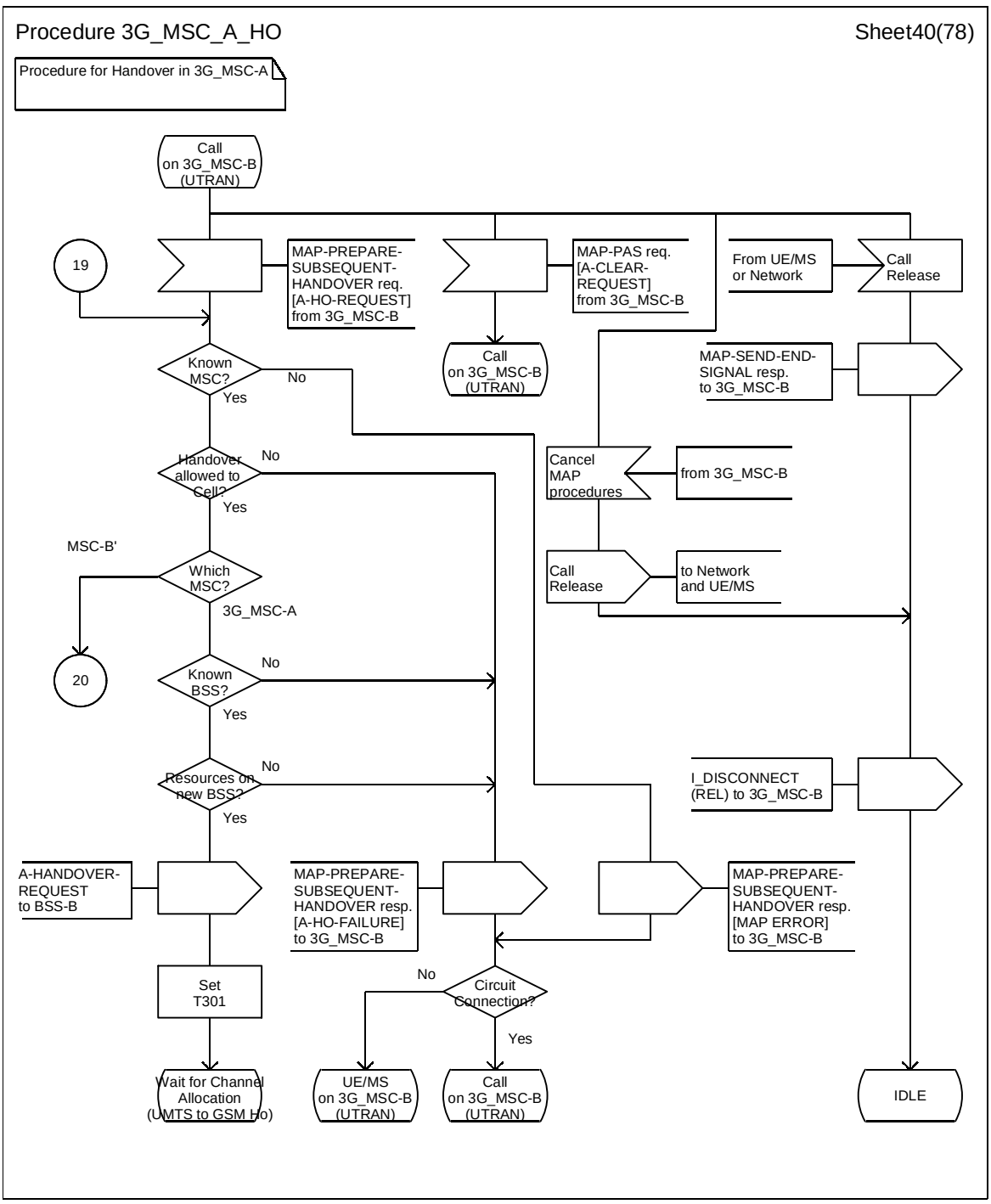

Procedure for Handover in 3G_MSC-A
Basic UMTS to GSM Handover to MSC-B Crcuit Connection required
14
MAP-PREPARE-HANDOVER req. [A-HO-REQUEST] to MSC-B
Wait For Acknowledgement from MSC-B (UMTS to GSM Ho)
MAP-PREPARE-HANDOVER esp. [A-HO-REQUEST-ACK] from MSC-B
MAP-PREPARE-HANDOVER resp. [A-HO-FAILURE] from MSC-B
MAP-PREPARE-HANDOVER resp. [MAP ERROR] from MSC-B
Handover Number?
Not Requested
Requested
I_CONNECT (IAM) to MSC-B using Handover Number
Wait for Connection from MSC-B (UMTS to GSM Ho)
18
12

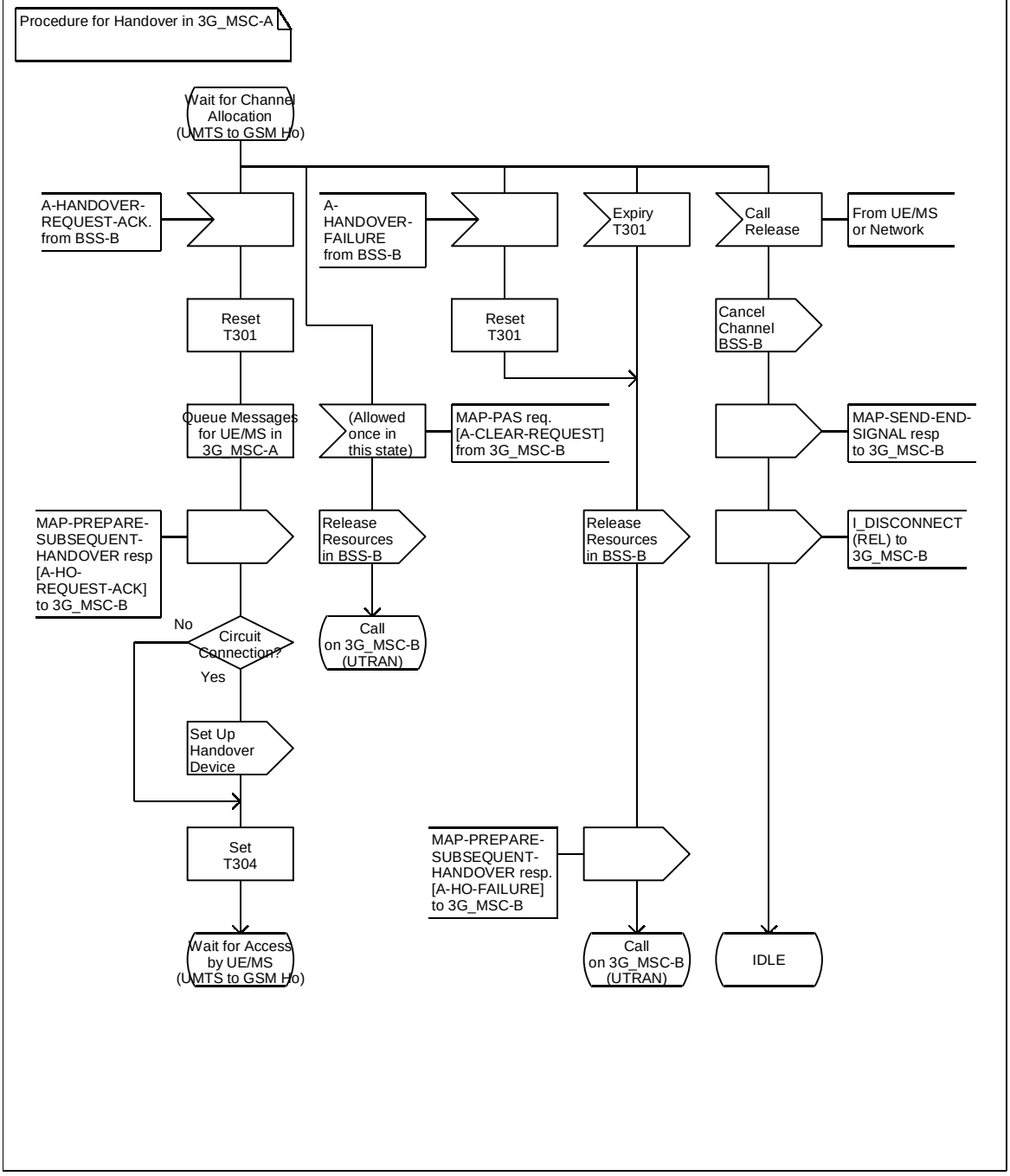

Procedure for Handover in 3G_MSC-A
Wait For Acknowledgement from MSC-B (UMTS to GSM Ho)
ERROR
from MSC-B
Iu-RELEASE-REQUEST from RNS-A
Call Release
From UE/MS or Network
Cancel MAP Resources
in 3G_MSC-A
to Network
Call Release
Release Resources in RNS-A
Cancel MAP Resources
to MSC-B
12
IDLE

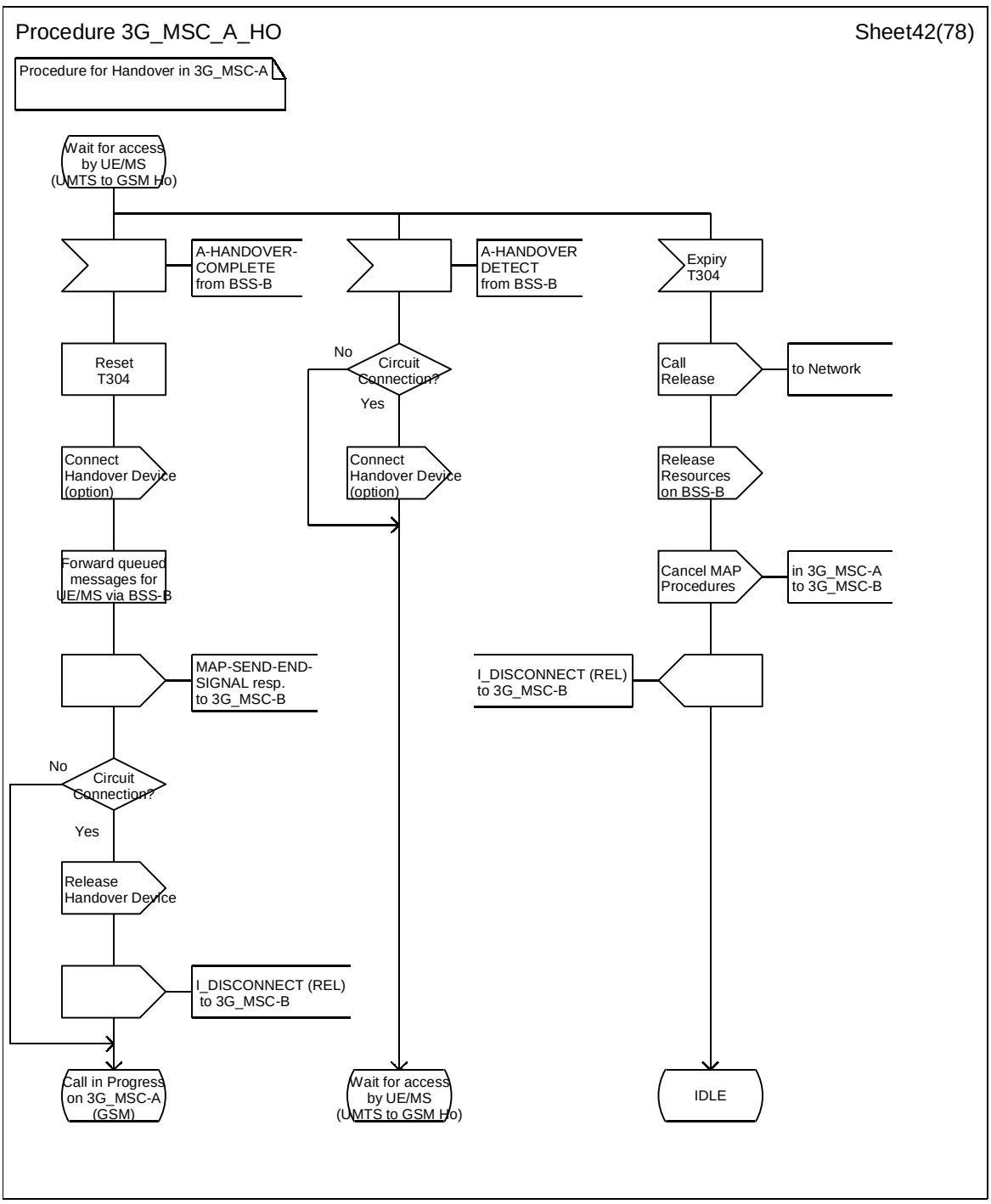

Procedure for Handover in 3G_MSC-A
Wait for Connection from MSC-B (UMTS to GSM Ho)
I_COMPLETE (ACM) from MSC-B
Iu-RELEASE-REQUEST from RNS-A
(Allowed once in this state)
From UE/MS or Network
Call Release
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Call Release
to UE/MS and Network
Queue Messages for UE/MS in 3G_MSC-A
Wait for Connection from MSC-B (UMTS to GSM Ho)
ERROR
from MSC-B or Network
Release Resources in RNS-A
Iu-Relocation Command to RNS-A
I_DISCONNECT (REL) to MSC-B
Set T303
to MSC-B in 3G_MSC-A
Cancel MAP Procedures
Set Up the Handover Device
Internal message in 3G_MSC-A
I_DISCONNECT (REL) to MSC-B
Wait for Completion on MSC-B (UMTS to GSM Ho)
12
IDLE

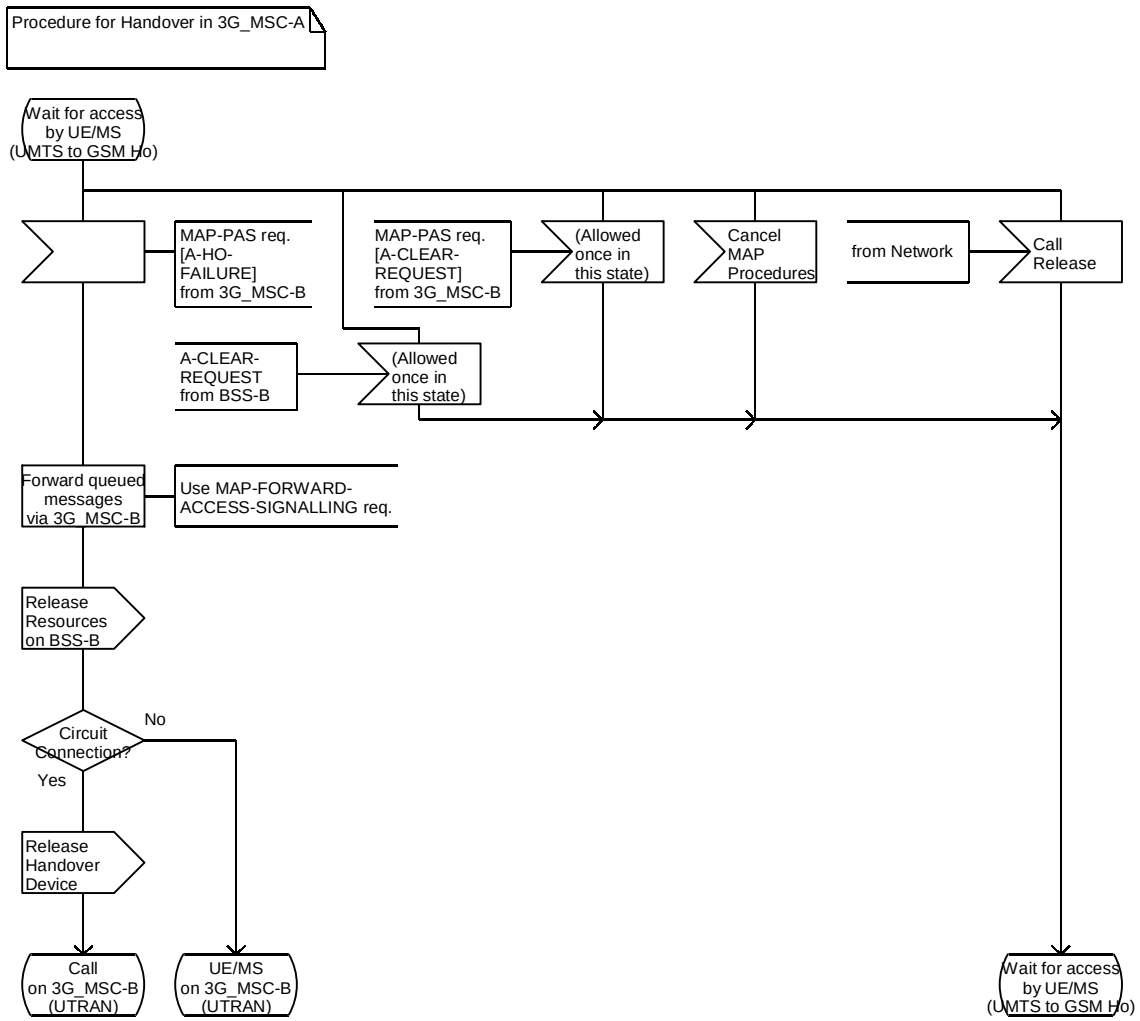

Procedure for Handover in 3G_MSC-A
Wait for Completion on MSC-B (UMTS to GSM Ho)
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] from MSC-B
I-ANSWER (ANM) from MSC-B
MAP-PAS req. [A-HO-DETECT] from MSC-B
Reset T303
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Iu-RELEASE-REQUEST from RNS-A
Release Resources on RNS-A
Connect Handover Device (option)
Yes
Wait for UE/MS on MSC-B?
No
Wait for Completion on MSC-B (UMTS to GSM Ho)
Call Release
to Network and UE/MS
Forward queued messages via MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req
Release MAP Resources
to MSC-B in 3G_MSC-A
Connect Handover Device (option)
Release Resources on RNS-A
I_DISCONNECT (REL) to MSC-B
Call on MSC-B (GSM)
IDLE
Wait for Completion on MSC-B (UMTS to GSM Ho)

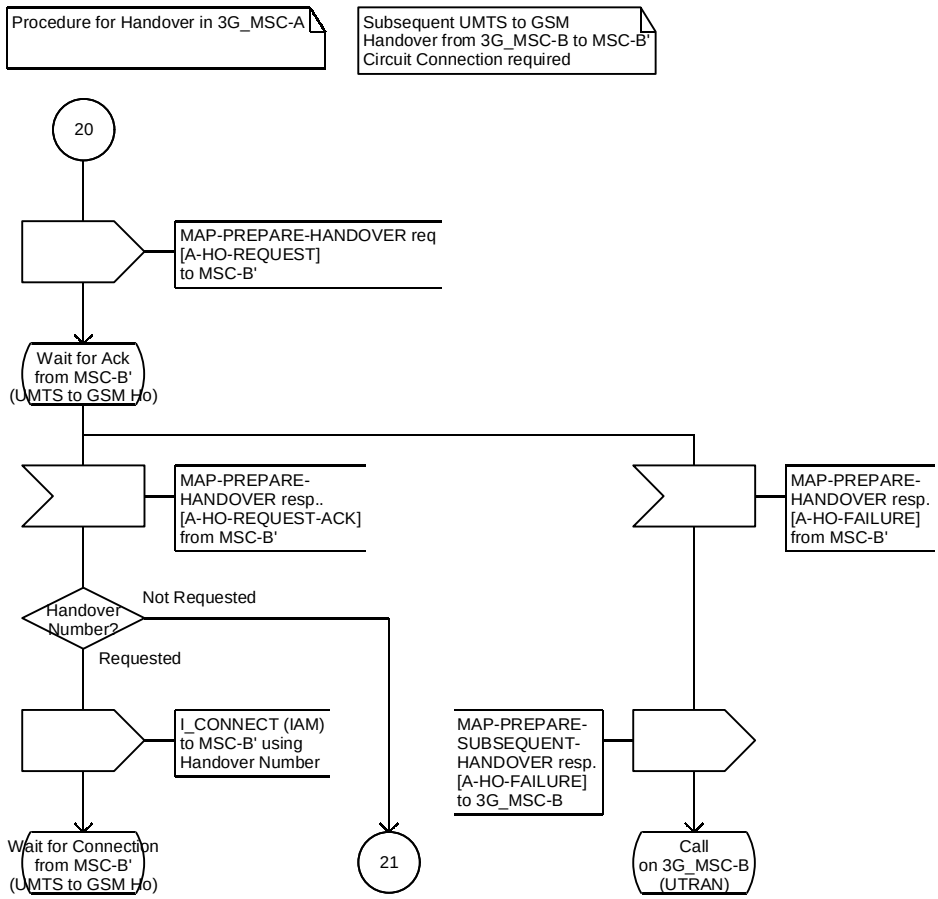

Procedure for Handover in 3G_MSC-A
Wait for Completion on MSC-B (UMTS to GSM Ho)
Iu-RELOCATION-CANCEL from RNS-A
I_DISCONNECT (REL) from MSC-B
Expiry T303
Call Release
from Network
Reset T303
Cancel MAP Procedures
In 3G_MSC-A and to MSC-B
Release Handover Device
Internal to 3G_MSC-A
Forward queued messages for UE/MS via RNS-A
Release Handover Device
Internal to 3G_MSC-A
Wait for Completion on MSC-B (UMTS to GSM Ho)
Release Handover Device
I_DISCONNECT (REL) to MSC-B
in 3G_MSC-A to MSC-B
Cancel MAP Procedures
from MSC-B
Cancel MAP Procedures
Cancel MAP Procedures
In 3G_MSC-A and to MSC-B
I_DISCONNECT (REL) to MSC-B
Release Handover Device
Release Handover Device
Internal to 3G_MSC-A
I_DISCONNECT (REL) to MSC-B
Release Resources RNS-A
Call in Progress on 3G_MSC-A (UTRAN)
Wait for Completion on MSC-B (UMTS to GSM Ho)
IDLE

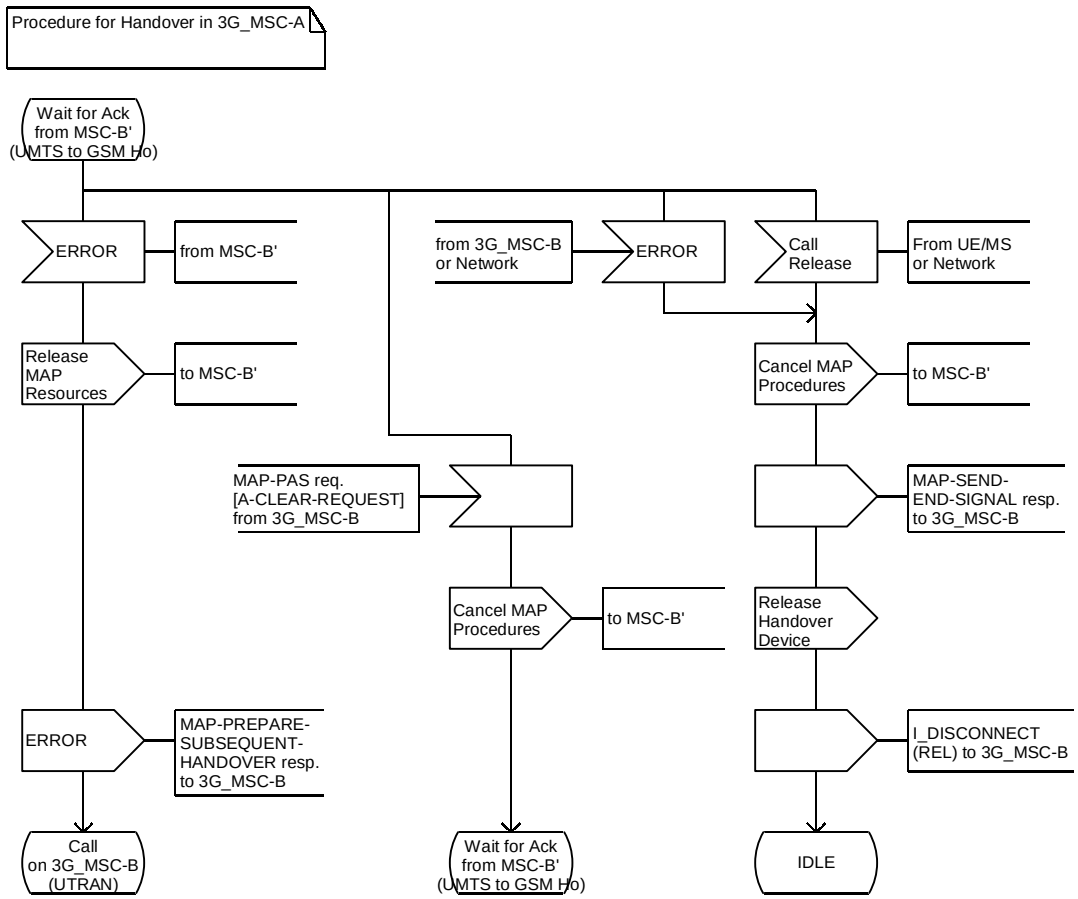

Procedure for Handover in 3G_MSC-A
Call on 3G_MSC-B (UTRAN)
19
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [A-HO-REQUEST] from 3G_MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
From UE/MS or Network
Call Release
Call on 3G_MSC-B (UTRAN)
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Known MSC?
No
Yes
Handover allowed to Cell?
No
Yes
Cancel MAP procedures
from 3G_MSC-B
MSC-B'
Which MSC?
3G_MSC-A
Call Release
to Network and UE/MS
20
Known BSS?
No
Yes
Resources on new BSS?
No
Yes
I_DISCONNECT (REL) to 3G_MSC-B
A-HANDOVER-REQUEST to BSS-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE] to 3G_MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [MAP ERROR] to 3G_MSC-B
Set T301
No
Circuit Connection?
Yes
Wait for Channel Allocation (UMTS to GSM Ho)
UE/MS on 3G_MSC-B (UTRAN)
Call on 3G_MSC-B (UTRAN)
IDLE

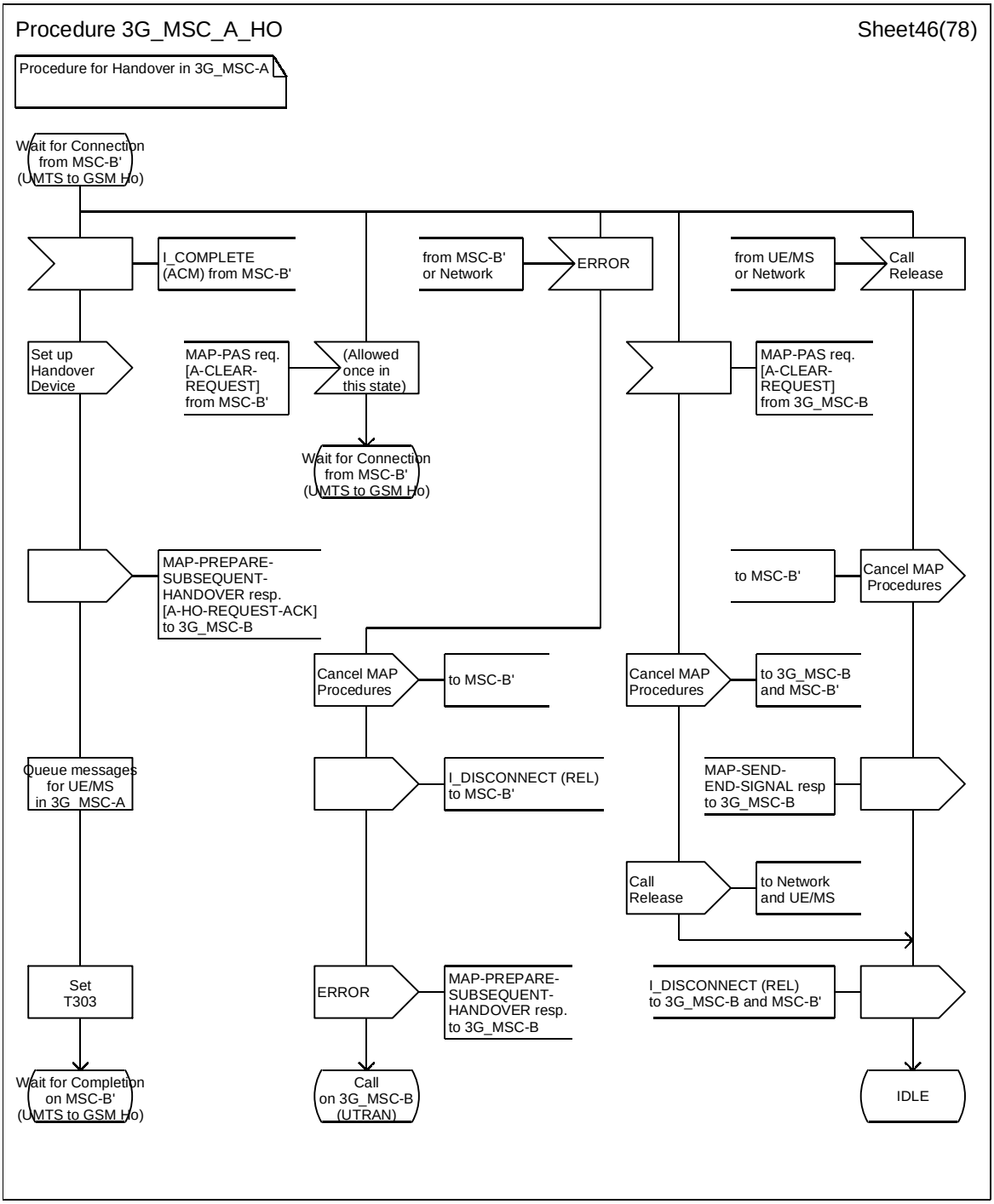

Procedure for Handover in 3G_MSC-A
Wait for Channel Allocation (UMTS to GSM Ho)
A-HANDOVER-REQUEST-ACK. from BSS-B
A-HANDOVER-FAILURE from BSS-B
Expiry T301
Call Release
From UE/MS or Network
Reset T301
Reset T301
Cancel Channel BSS-B
Queue Messages for UE/MS in 3G_MSC-A
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
MAP-SEND-END-SIGNAL resp to 3G_MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp [A-HO-REQUEST-ACK] to 3G_MSC-B
Release Resources in BSS-B
Release Resources in BSS-B
I_DISCONNECT (REL) to 3G_MSC-B
No
Circuit Connection?
Yes
Call on 3G_MSC-B (UTRAN)
Set Up Handover Device
Set T304
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE] to 3G_MSC-B
Wait for Access by UE/MS (UMTS to GSM Ho)
Call on 3G_MSC-B (UTRAN)
IDLE

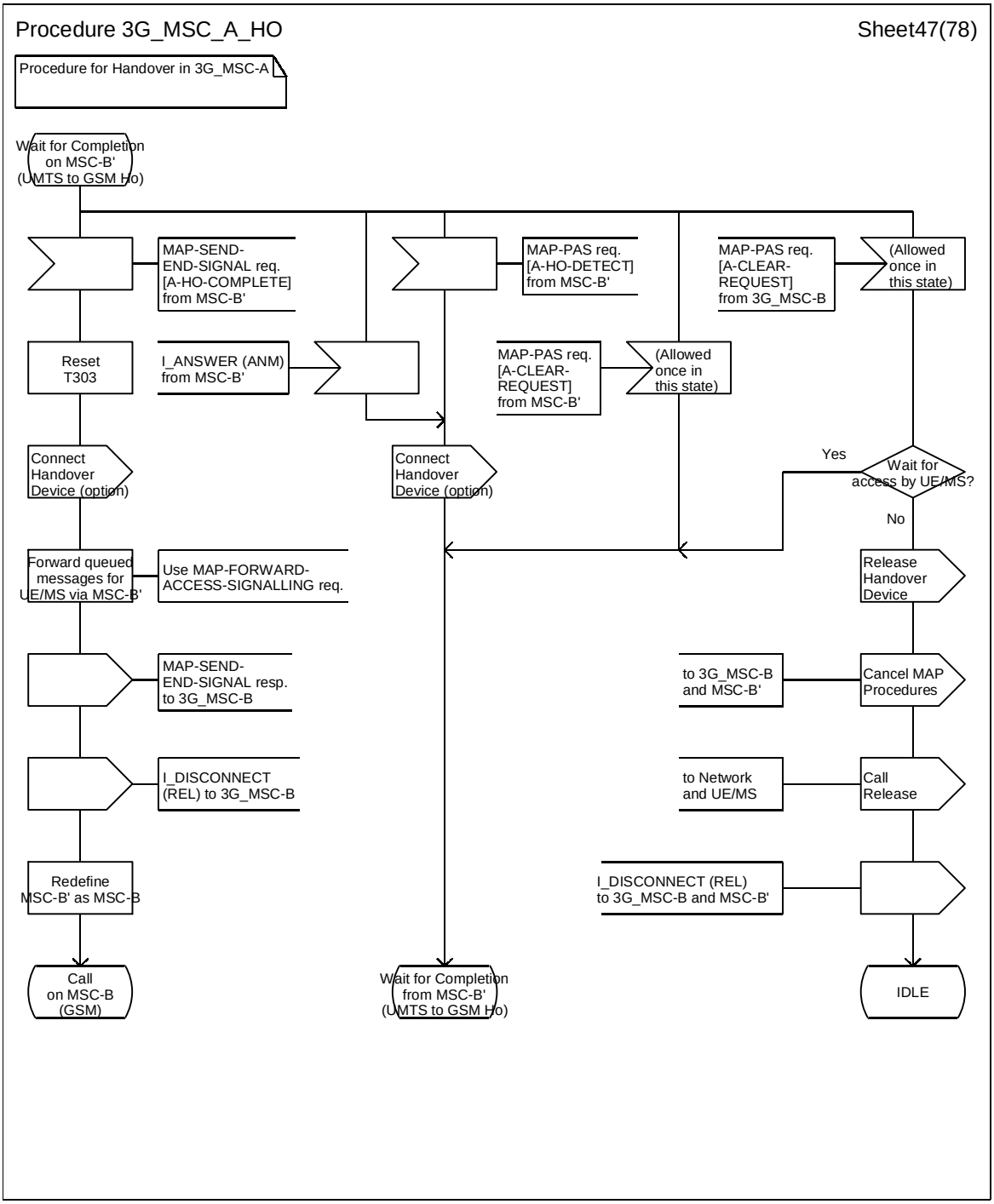

Procedure for Handover in 3G_MSC-A
Wait for access by UE/MS (UMTS to GSM Ho)
A-HANDOVER-COMPLETE from BSS-B
A-HANDOVER DETECT from BSS-B
Expiry T304
Reset T304
No
Circuit Connection?
Yes
Call Release
to Network
Connect Handover Device (option)
Connect Handover Device (option)
Release Resources on BSS-B
Forward queued messages for UE/MS via BSS-B
Cancel MAP Procedures
in 3G_MSC-A to 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B
No
Circuit Connection?
Yes
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-B
Call in Progress on 3G_MSC-A (GSM)
Wait for access by UE/MS (UMTS to GSM Ho)
IDLE

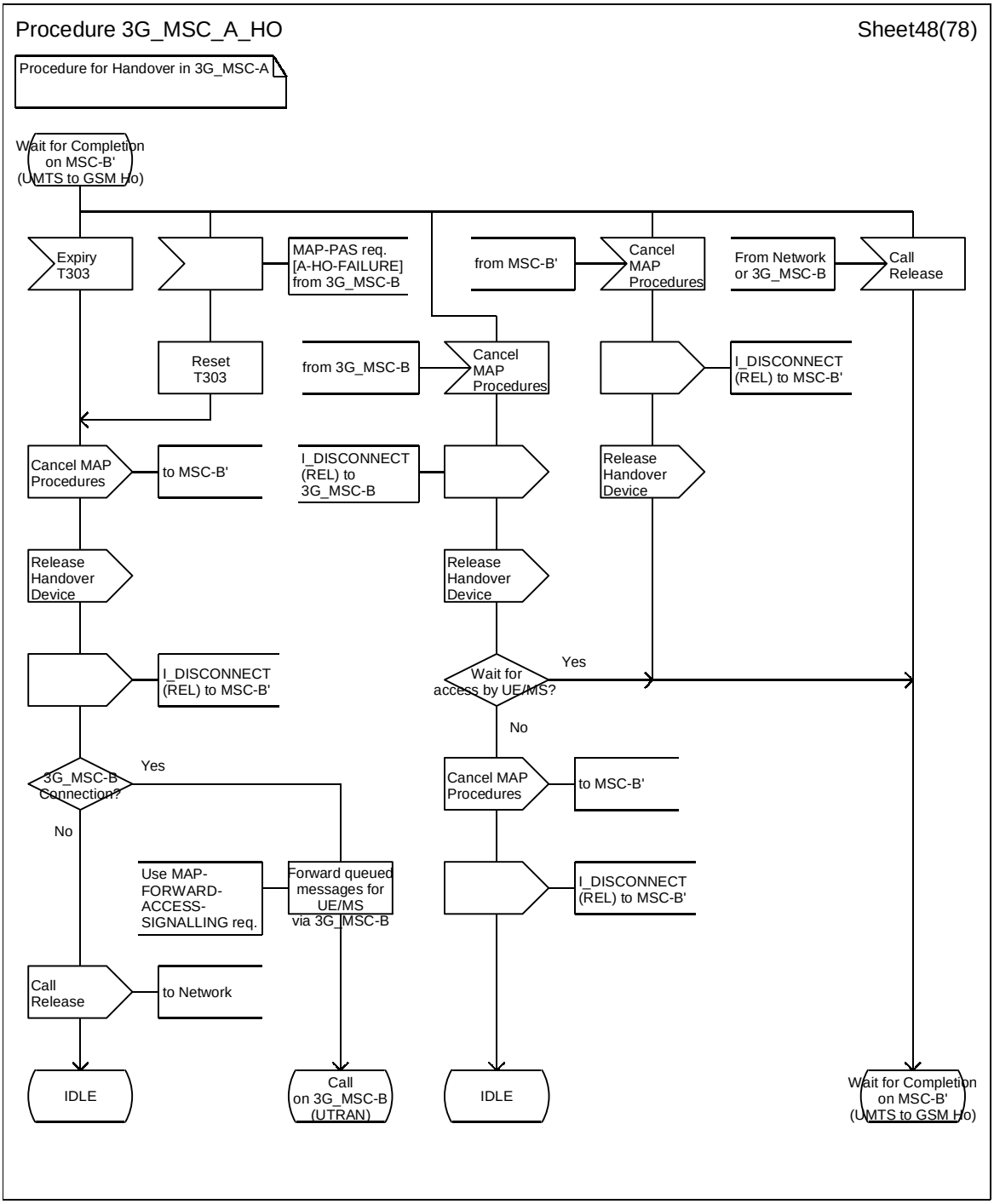

Procedure for Handover in 3G_MSC-A
Wait for access by UE/MS (UMTS to GSM Ho)
MAP-PAS req. [A-HO-FAILURE] from 3G_MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Cancel MAP Procedures
from Network
Call Release
A-CLEAR-REQUEST from BSS-B
(Allowed once in this state)
Forward queued messages via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release Resources on BSS-B
Circuit Connection?
No
Yes
Release Handover Device
Call on 3G_MSC-B (UTRAN)
UE/MS on 3G_MSC-B (UTRAN)
Wait for access by UE/MS (UMTS to GSM Ho)

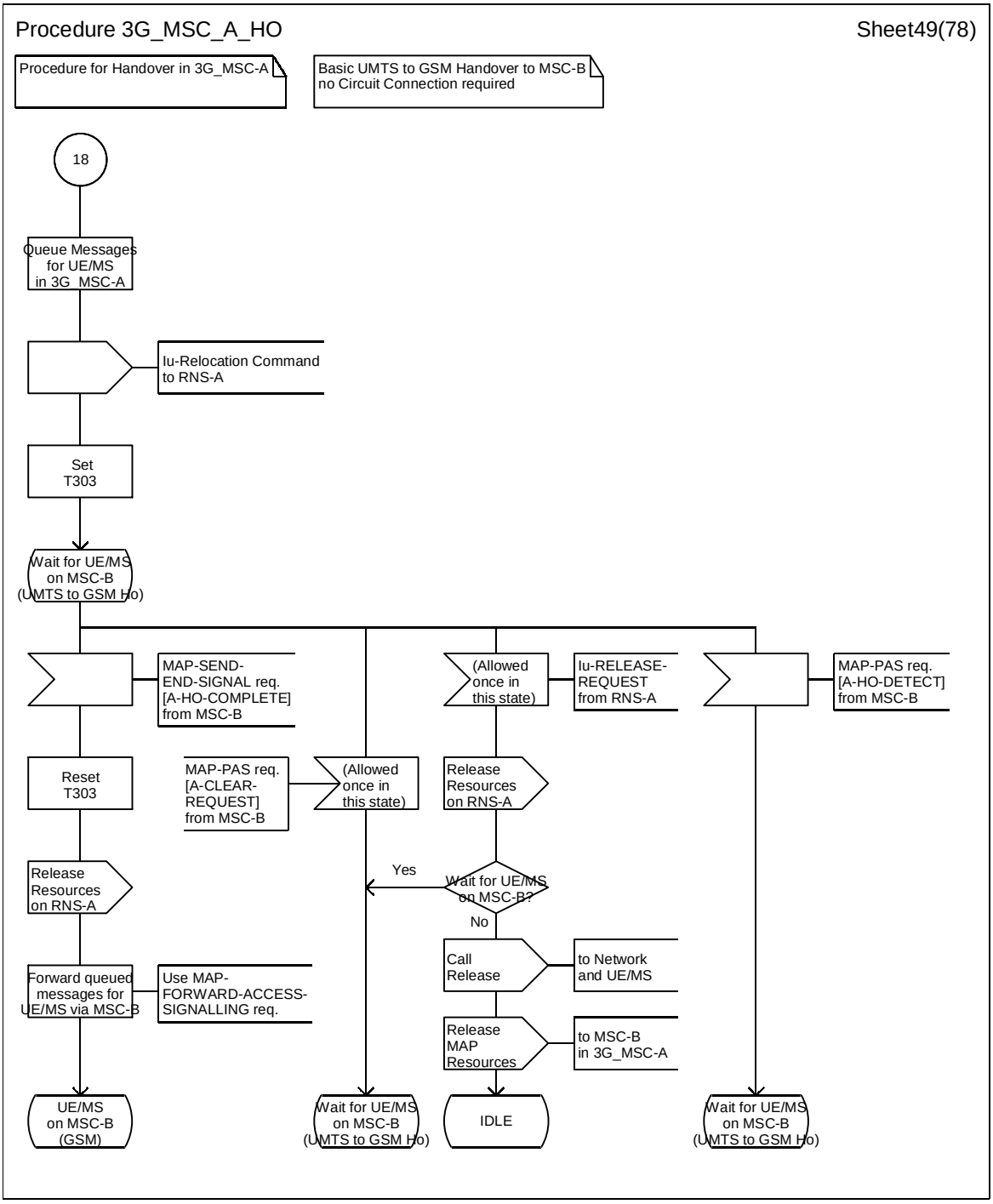

Procedure for Handover in 3G_MSC-A
Subsequent UMTS to GSM Handover from 3G_MSC-B to MSC-B' Circuit Connection required
20
MAP-PREPARE-HANDOVER req [A-HO-REQUEST] to MSC-B'
Wait for Ack from MSC-B' (UMTS to GSM Ho)
MAP-PREPARE-HANDOVER resp.. [A-HO-REQUEST-ACK] from MSC-B'
MAP-PREPARE-HANDOVER resp. [A-HO-FAILURE] from MSC-B'
Handover Number?
Not Requested
Requested
I_CONNECT (IAM) to MSC-B' using Handover Number
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE] to 3G_MSC-B
Wait for Connection from MSC-B' (UMTS to GSM Ho)
21
Call on 3G_MSC-B (UTRAN)

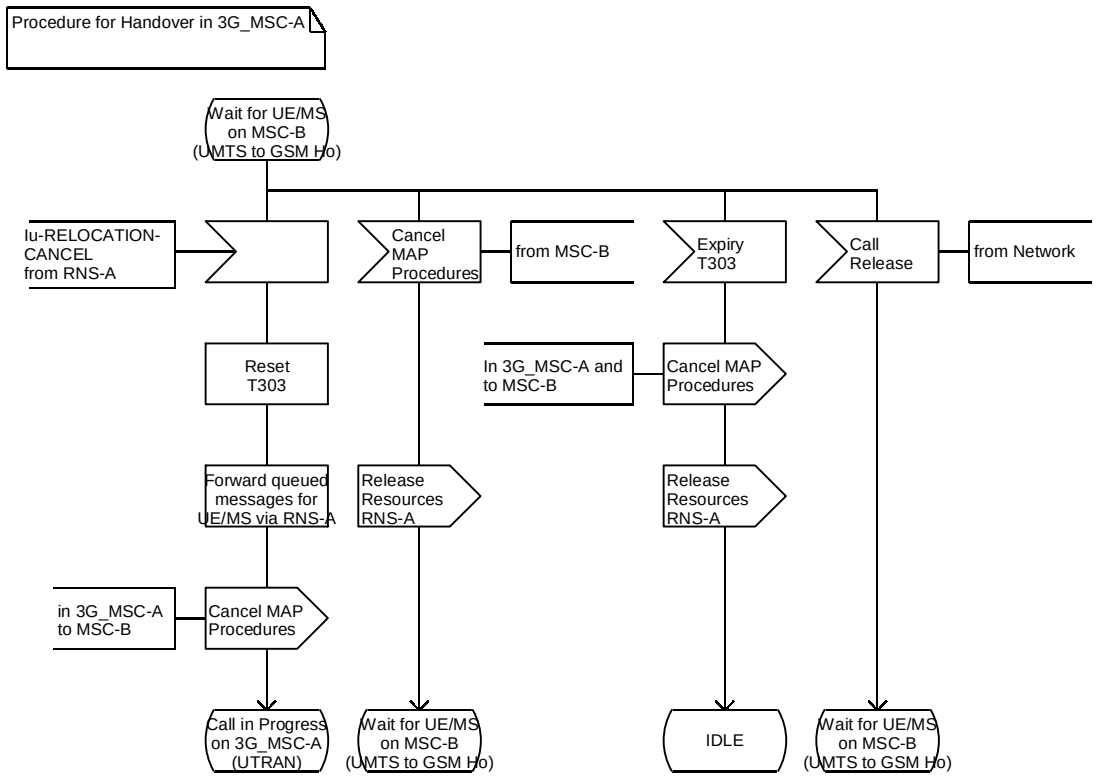

Procedure for Handover in 3G_MSC-A
Wait for Ack from MSC-B' (UMTS to GSM Ho)
ERROR
from MSC-B'
from 3G_MSC-B or Network
ERROR
Call Release
From UE/MS or Network
Release MAP Resources
to MSC-B'
Cancel MAP Procedures
to MSC-B'
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Cancel MAP Procedures
to MSC-B'
Release Handover Device
ERROR
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B
Call on 3G_MSC-B (UTRAN)
Wait for Ack from MSC-B' (UMTS to GSM Ho)
IDLE

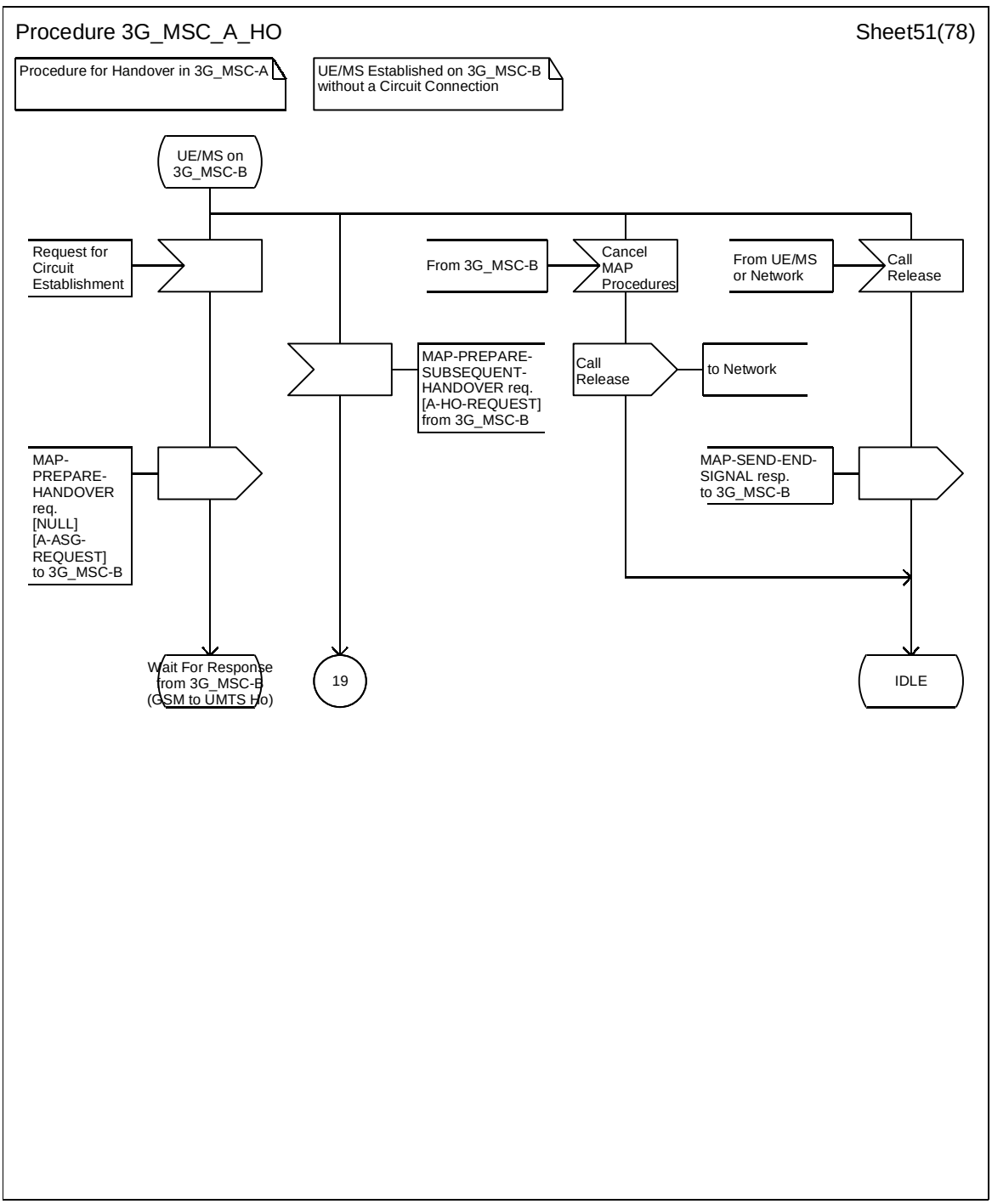

Procedure for Handover in 3G_MSC-A
Wait for Connection from MSC-B' (UMTS to GSM Ho)
I_COMPLETE (ACM) from MSC-B'
from MSC-B' or Network
ERROR
from UE/MS or Network
Call Release
Set up Handover Device
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B'
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
Wait for Connection from MSC-B' (UMTS to GSM Ho)
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-REQUEST-ACK] to 3G_MSC-B
to MSC-B'
Cancel MAP Procedures
Cancel MAP Procedures
to MSC-B'
Cancel MAP Procedures
to 3G_MSC-B and MSC-B'
Queue messages for UE/MS in 3G_MSC-A
I_DISCONNECT (REL) to MSC-B'
MAP-SEND-END-SIGNAL resp to 3G_MSC-B
Call Release
to Network and UE/MS
Set T303
ERROR
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B and MSC-B'
Wait for Completion on MSC-B' (UMTS to GSM Ho)
Call on 3G_MSC-B (UTRAN)
IDLE


Procedure for Handover in 3G_MSC-A
Wait for Completion on MSC-B' (UMTS to GSM Ho)
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] from MSC-B'
MAP-PAS req. [A-HO-DETECT] from MSC-B'
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Reset T303
I_ANSWER (ANM) from MSC-B'
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B'
(Allowed once in this state)
Connect Handover Device (option)
Connect Handover Device (option)
Yes
Wait for access by UE/MS?
No
Forward queued messages for UE/MS via MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release Handover Device
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
to 3G_MSC-B and MSC-B'
Cancel MAP Procedures
I_DISCONNECT (REL) to 3G_MSC-B
to Network and UE/MS
Call Release
Redefine MSC-B' as MSC-B
I_DISCONNECT (REL) to 3G_MSC-B and MSC-B'
Call on MSC-B (GSM)
Wait for Completion from MSC-B' (UMTS to GSM Ho)
IDLE

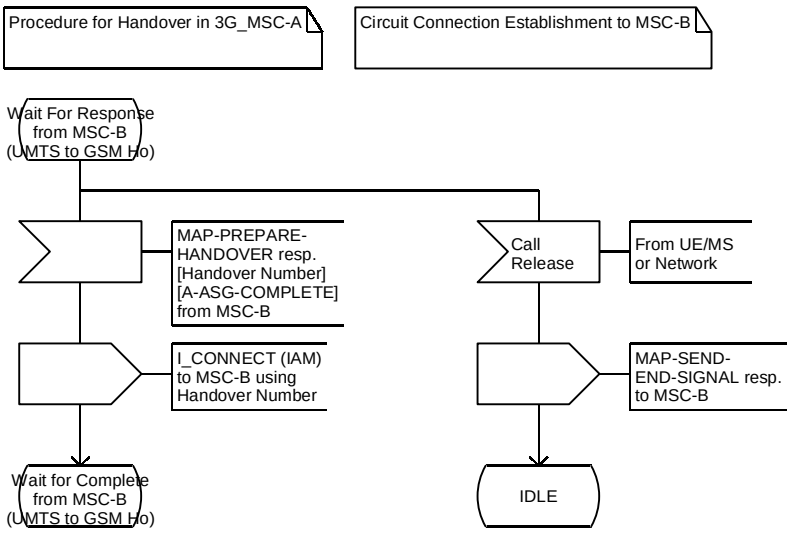

Procedure for Handover in 3G_MSC-A
Wait for Completion on MSC-B' (UMTS to GSM Ho)
Expiry T303
MAP-PAS req. [A-HO-FAILURE] from 3G_MSC-B
from MSC-B'
Cancel MAP Procedures
From Network or 3G_MSC-B
Call Release
Reset T303
from 3G_MSC-B
Cancel MAP Procedures
I_DISCONNECT (REL) to MSC-B'
Cancel MAP Procedures
to MSC-B'
I_DISCONNECT (REL) to 3G_MSC-B
Release Handover Device
Release Handover Device
Release Handover Device
I_DISCONNECT (REL) to MSC-B'
Wait for access by UE/MS?
Yes
No
3G_MSC-B Connection?
Yes
No
Cancel MAP Procedures
to MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Forward queued messages for UE/MS via 3G_MSC-B
I_DISCONNECT (REL) to MSC-B'
Call Release
to Network
IDLE
Call on 3G_MSC-B (UTRAN)
IDLE
Wait for Completion on MSC-B' (UMTS to GSM Ho)

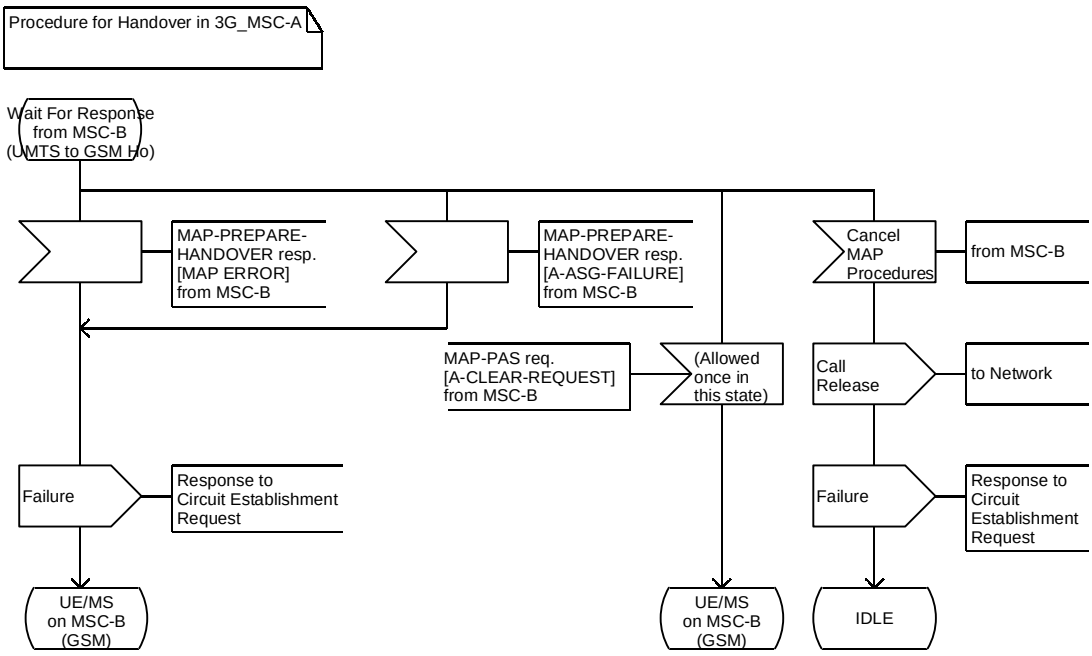

Procedure for Handover in 3G_MSC-A
Basic UMTS to GSM Handover to MSC-B
no Circuit Connection required
18
Queue Messages for UE/MS in 3G_MSC-A
Iu-Relocation Command to RNS-A
Set T303
Wait for UE/MS on MSC-B (UMTS to GSM Ho)
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] from MSC-B
(Allowed once in this state)
Iu-RELEASE-REQUEST from RNS-A
MAP-PAS req. [A-HO-DETECT] from MSC-B
Reset T303
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Release Resources on RNS-A
Yes
Wait for UE/MS on MSC-B?
No
Release Resources on RNS-A
Call Release
to Network and UE/MS
Forward queued messages for UE/MS via MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release MAP Resources
to MSC-B in 3G_MSC-A
UE/MS on MSC-B (GSM)
Wait for UE/MS on MSC-B (UMTS to GSM Ho)
IDLE
Wait for UE/MS on MSC-B (UMTS to GSM Ho)

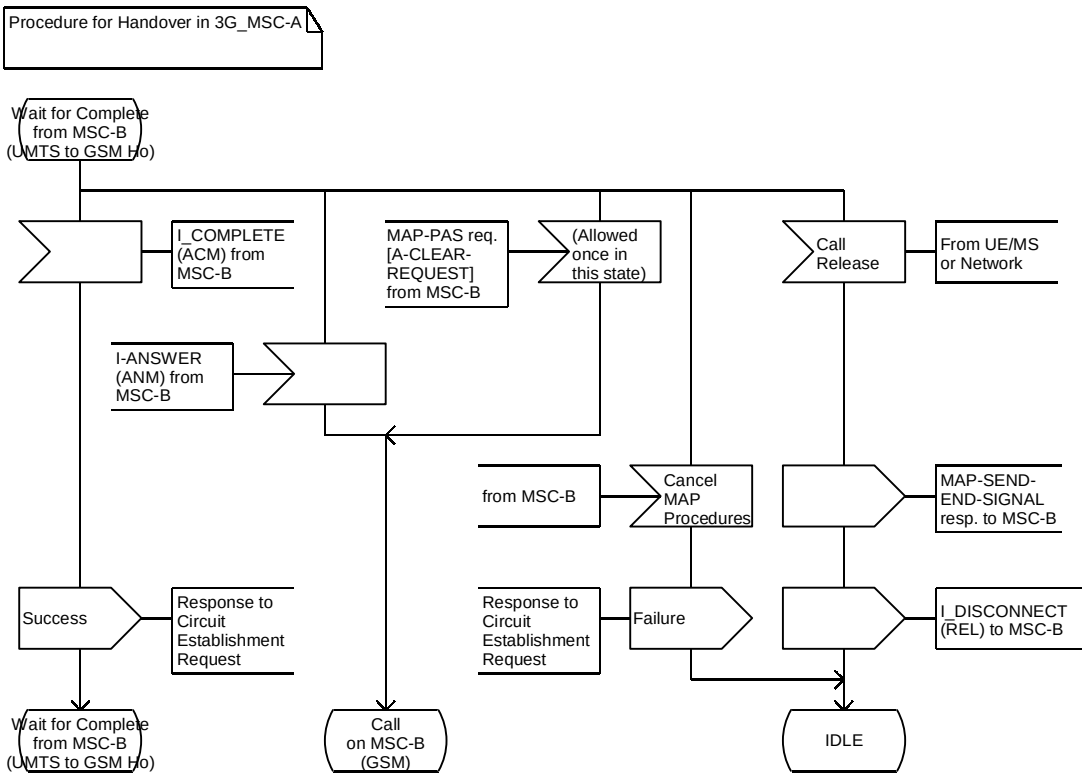

Procedure for Handover in 3G_MSC-A
Wait for UE/MS on MSC-B (UMTS to GSM Ho)
Iu-RELOCATION-CANCEL from RNS-A
Cancel MAP Procedures
from MSC-B
Expiry T303
Call Release
from Network
Reset T303
In 3G_MSC-A and to MSC-B
Cancel MAP Procedures
Forward queued messages for UE/MS via RNS-A
Release Resources RNS-A
Release Resources RNS-A
in 3G_MSC-A to MSC-B
Cancel MAP Procedures
Call in Progress on 3G_MSC-A (UTRAN)
Wait for UE/MS on MSC-B (UMTS to GSM Ho)
IDLE
Wait for UE/MS on MSC-B (UMTS to GSM Ho)

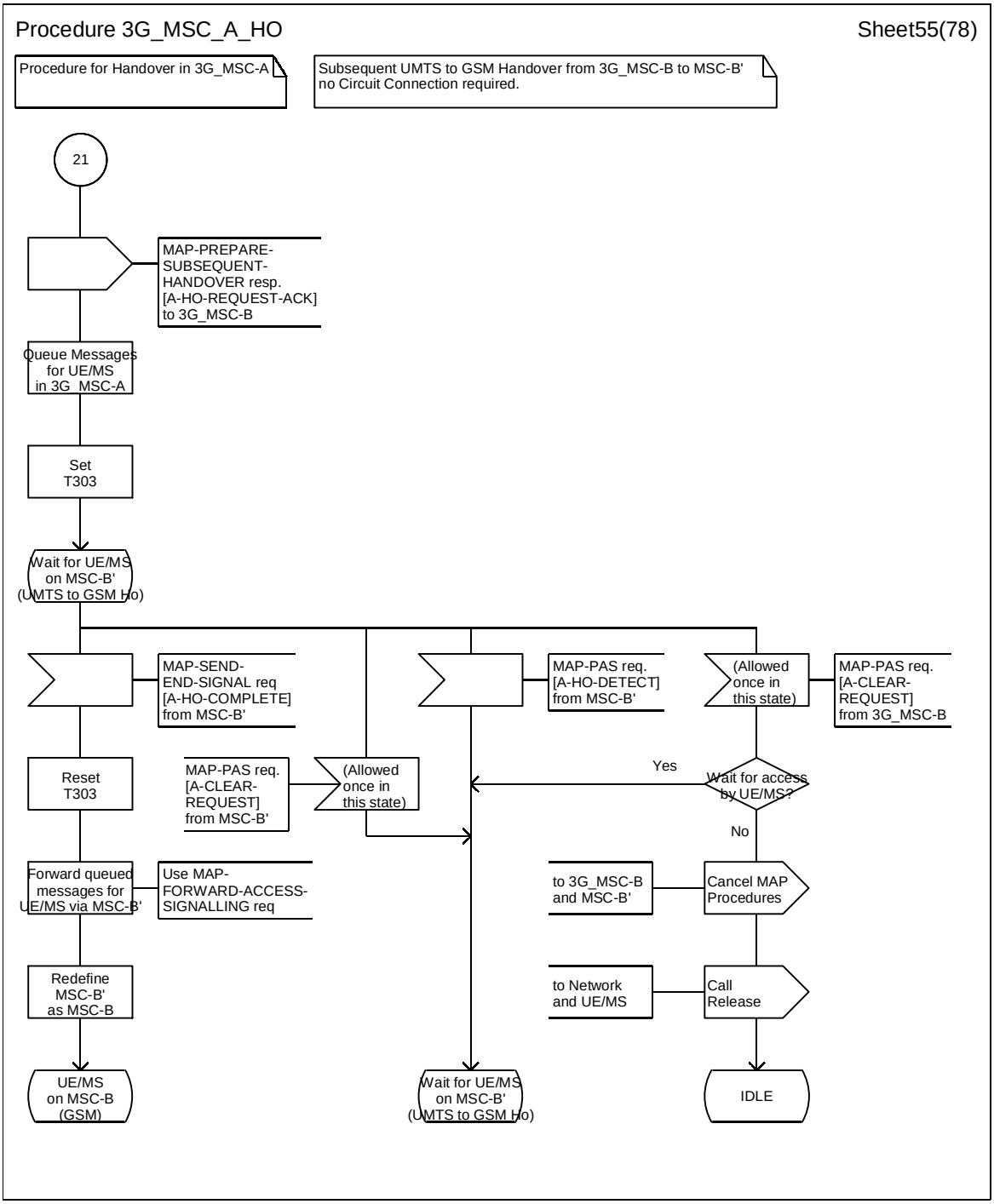

Procedure for Handover in 3G_MSC-A
UE/MS Established on 3G_MSC-B without a Circuit Connection
UE/MS on 3G_MSC-B
Request for Circuit Establishment
From 3G_MSC-B
Cancel MAP Procedures
From UE/MS or Network
Call Release
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [A-HO-REQUEST] from 3G_MSC-B
Call Release
to Network
MAP-PREPARE-HANDOVER req. [NULL] [A-ASG-REQUEST] to 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Wait For Response from 3G_MSC-B (GSM to UMTS Ho)
19
IDLE

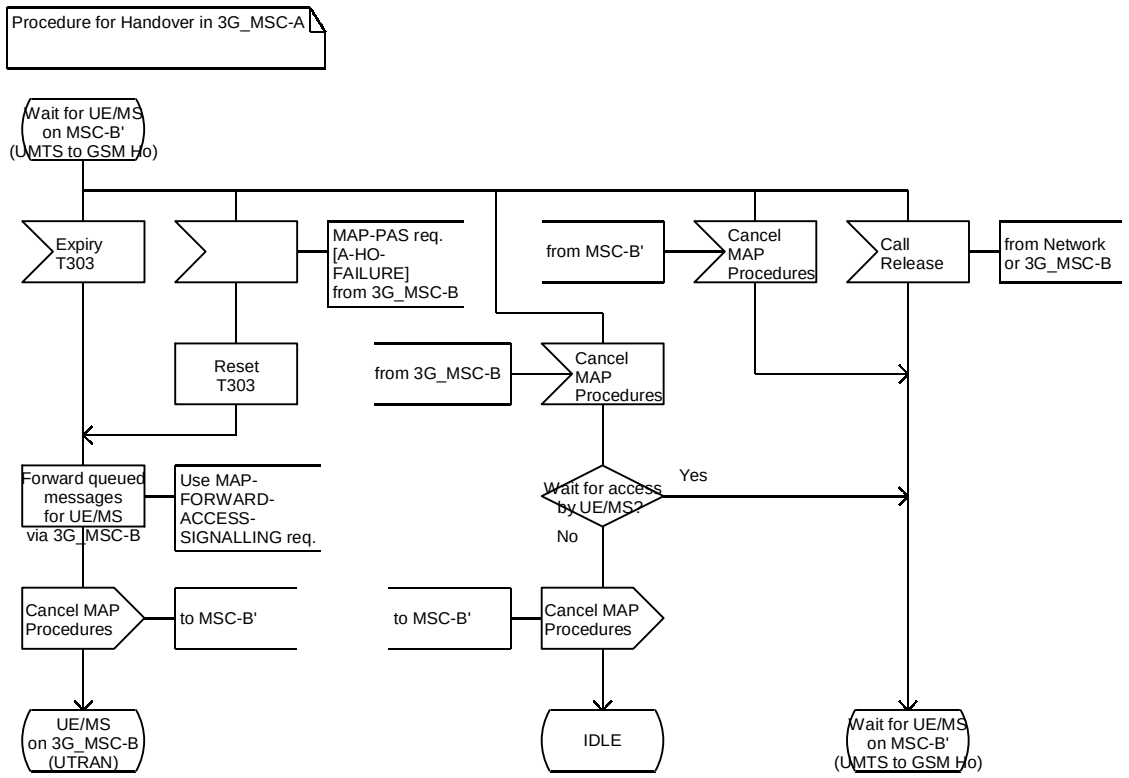
Procedure 3G_MSC_A_HO

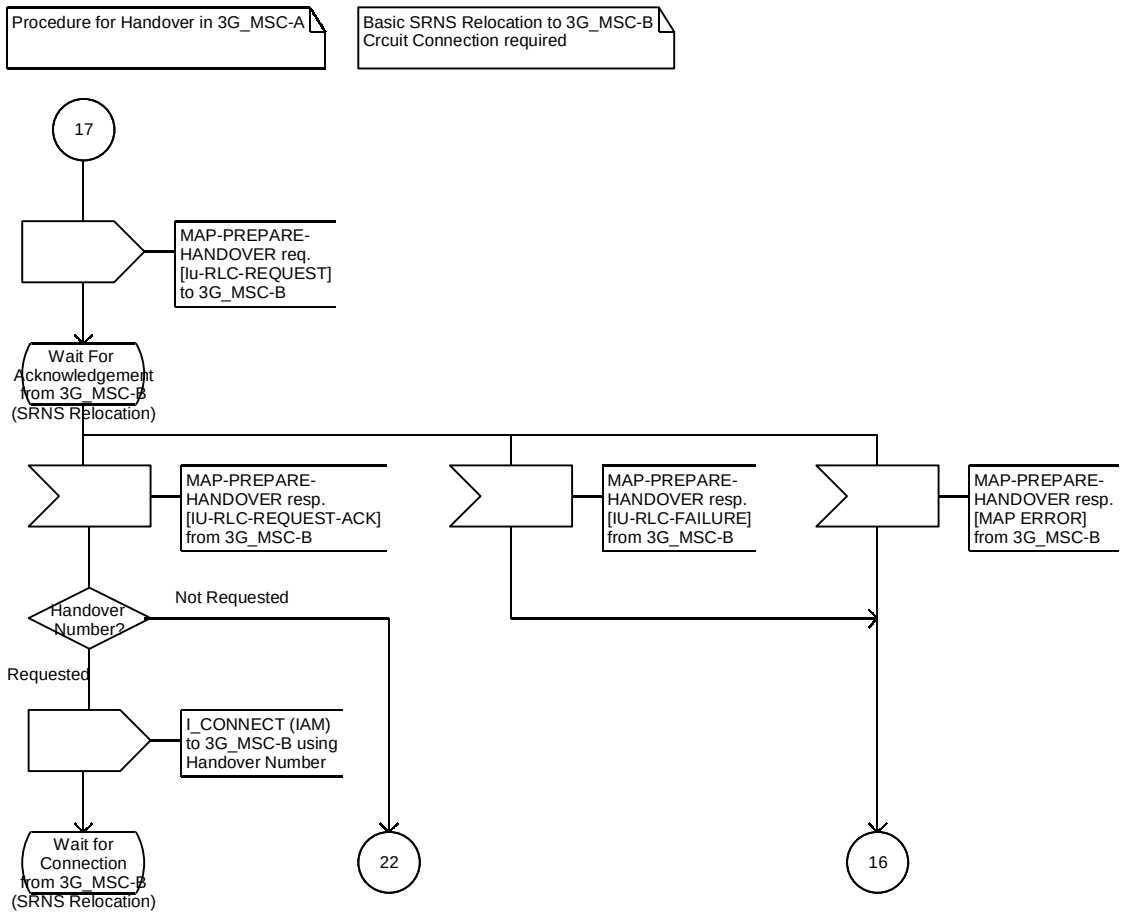


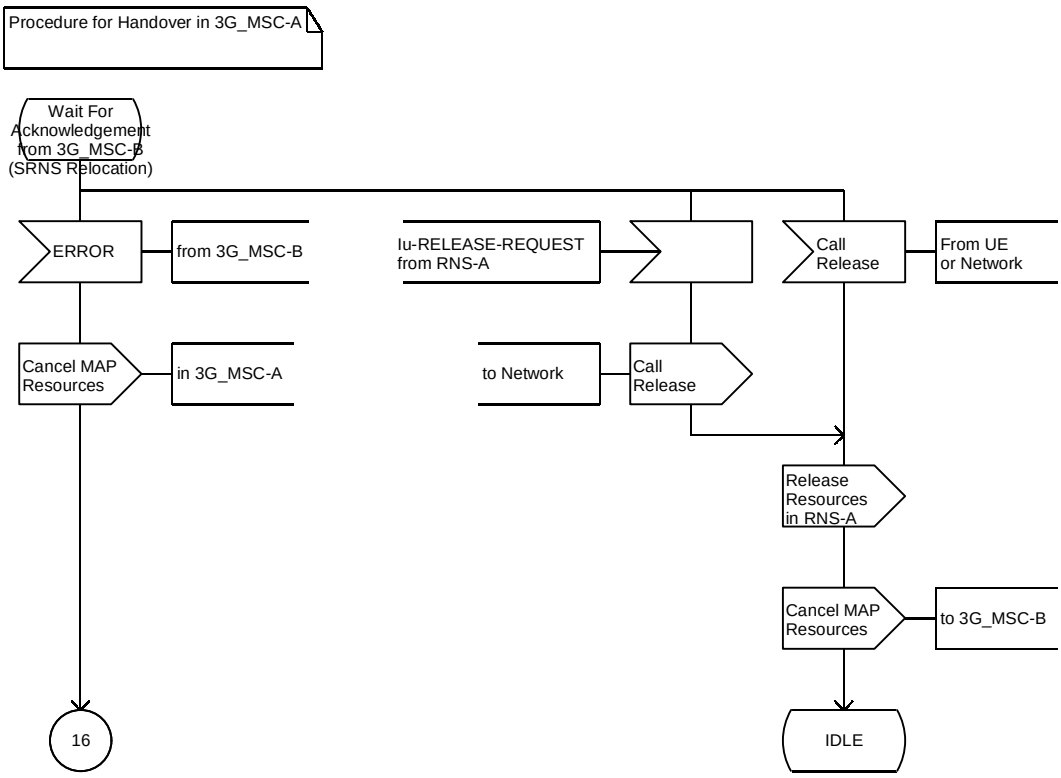

Procedure for Handover in 3G_MSC-A
Wait For Response from MSC-B (UMTS to GSM Ho)
MAP-PREPARE-HANDOVER resp. [MAP ERROR] from MSC-B
MAP-PREPARE-HANDOVER resp. [A-ASG-FAILURE] from MSC-B
Cancel MAP Procedures
from MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Call Release
to Network
Failure
Response to Circuit Establishment Request
Failure
Response to Circuit Establishment Request
UE/MS on MSC-B (GSM)
UE/MS on MSC-B (GSM)
IDLE

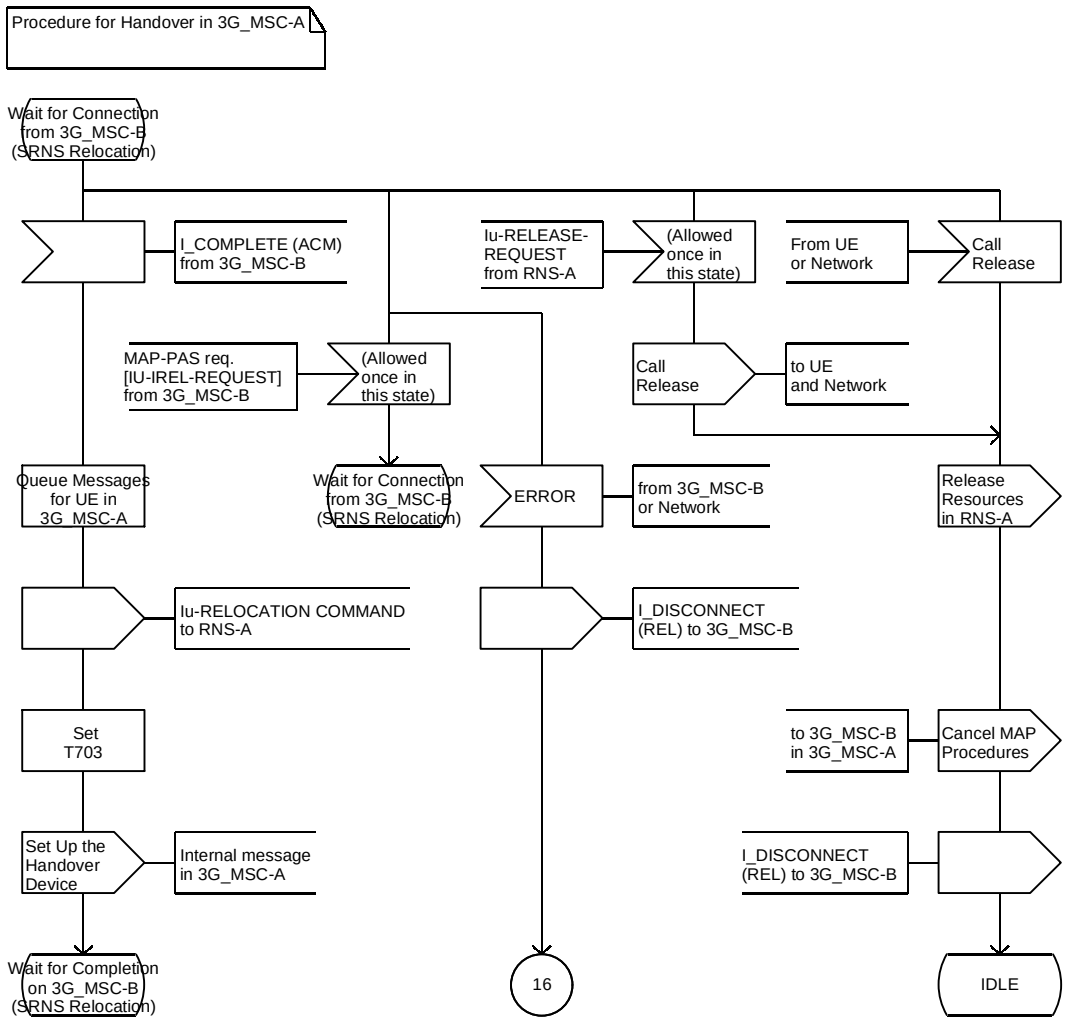

Procedure for Handover in 3G_MSC-A
Wait for Complete from MSC-B (UMTS to GSM Ho)
I_COMPLETE (ACM) from MSC-B
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B
(Allowed once in this state)
Call Release
From UE/MS or Network
I-ANSWER (ANM) from MSC-B
from MSC-B
Cancel MAP Procedures
MAP-SEND-END-SIGNAL resp. to MSC-B
Success
Response to Circuit Establishment Request
Response to Circuit Establishment Request
Failure
I_DISCONNECT (REL) to MSC-B
Wait for Complete from MSC-B (UMTS to GSM Ho)
Call on MSC-B (GSM)
IDLE

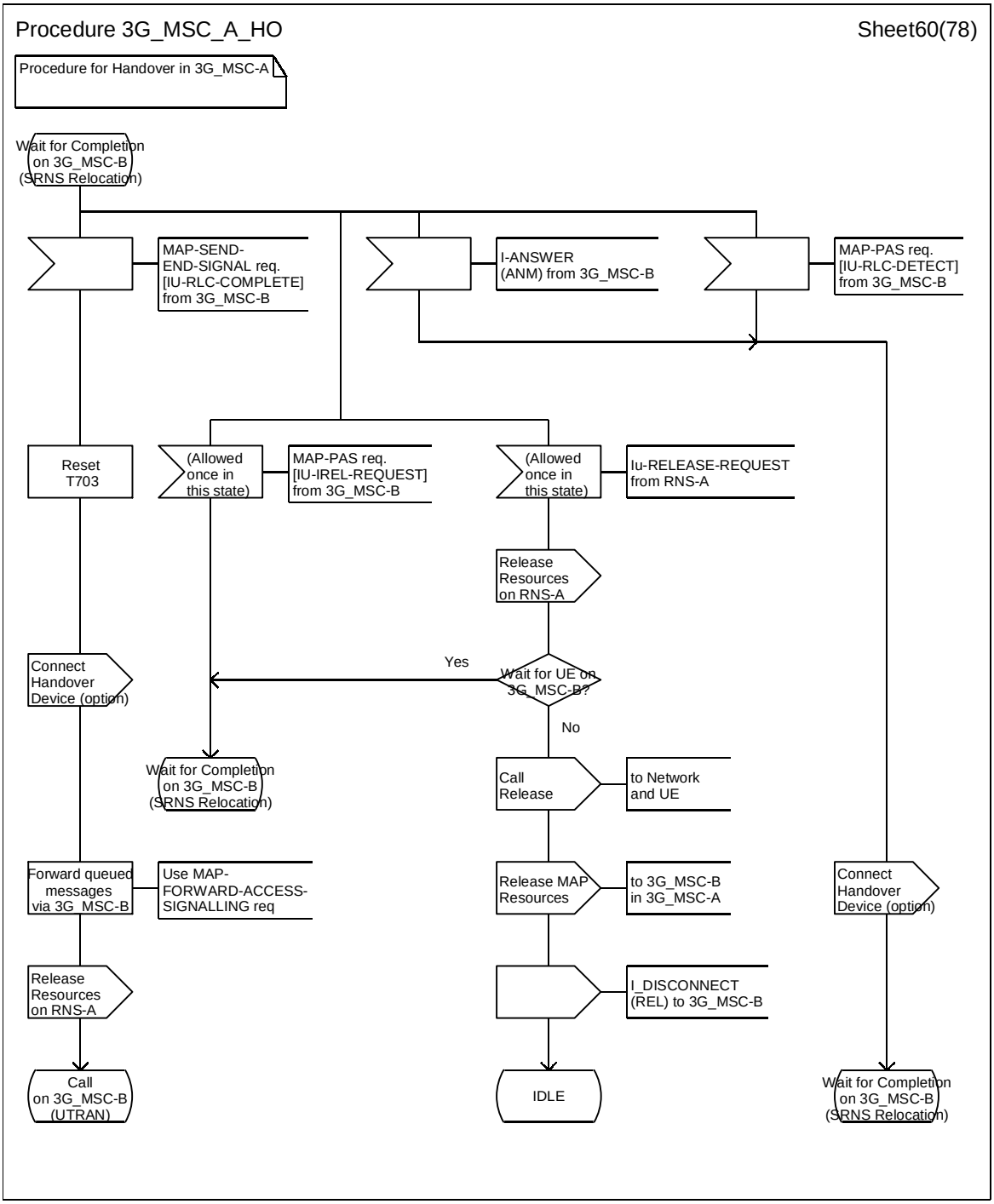

Procedure for Handover in 3G_MSC-A
Subsequent UMTS to GSM Handover from 3G_MSC-B to MSC-B'
no Circuit Connection required.
21
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-REQUEST-ACK] to 3G_MSC-B
Queue Messages for UE/MS in 3G_MSC-A
Set T303
Wait for UE/MS on MSC-B' (UMTS to GSM Ho)
MAP-SEND-END-SIGNAL req [A-HO-COMPLETE] from MSC-B'
MAP-PAS req. [A-HO-DETECT] from MSC-B'
(Allowed once in this state)
MAP-PAS req. [A-CLEAR-REQUEST] from 3G_MSC-B
Reset T303
MAP-PAS req. [A-CLEAR-REQUEST] from MSC-B'
(Allowed once in this state)
Yes
Wait for access by UE/MS?
No
Forward queued messages for UE/MS via MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req
to 3G_MSC-B and MSC-B'
Cancel MAP Procedures
Redefine MSC-B' as MSC-B
to Network and UE/MS
Call Release
UE/MS on MSC-B (GSM)
Wait for UE/MS on MSC-B' (UMTS to GSM Ho)
IDLE

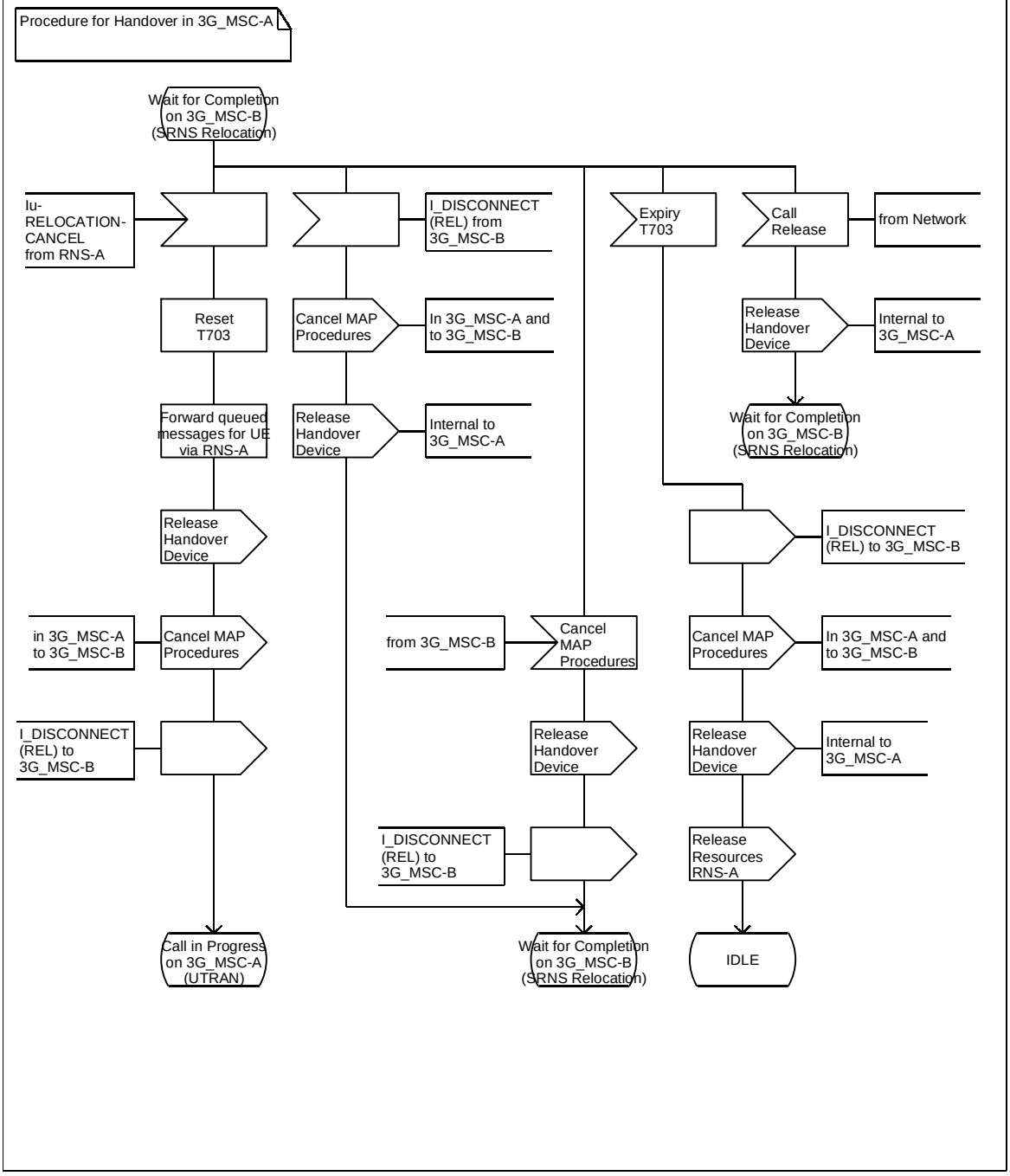

Procedure for Handover in 3G_MSC-A
Wait for UE/MS on MSC-B' (UMTS to GSM Ho)
Expiry T303
MAP-PAS req. [A-HO-FAILURE] from 3G_MSC-B
from MSC-B'
Cancel MAP Procedures
Call Release
from Network or 3G_MSC-B
Reset T303
from 3G_MSC-B
Cancel MAP Procedures
Forward queued messages for UE/MS via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Wait for access by UE/MS?
Yes
No
Cancel MAP Procedures
to MSC-B'
to MSC-B'
Cancel MAP Procedures
UE/MS on 3G_MSC-B (UTRAN)
IDLE
Wait for UE/MS on MSC-B' (UMTS to GSM Ho)

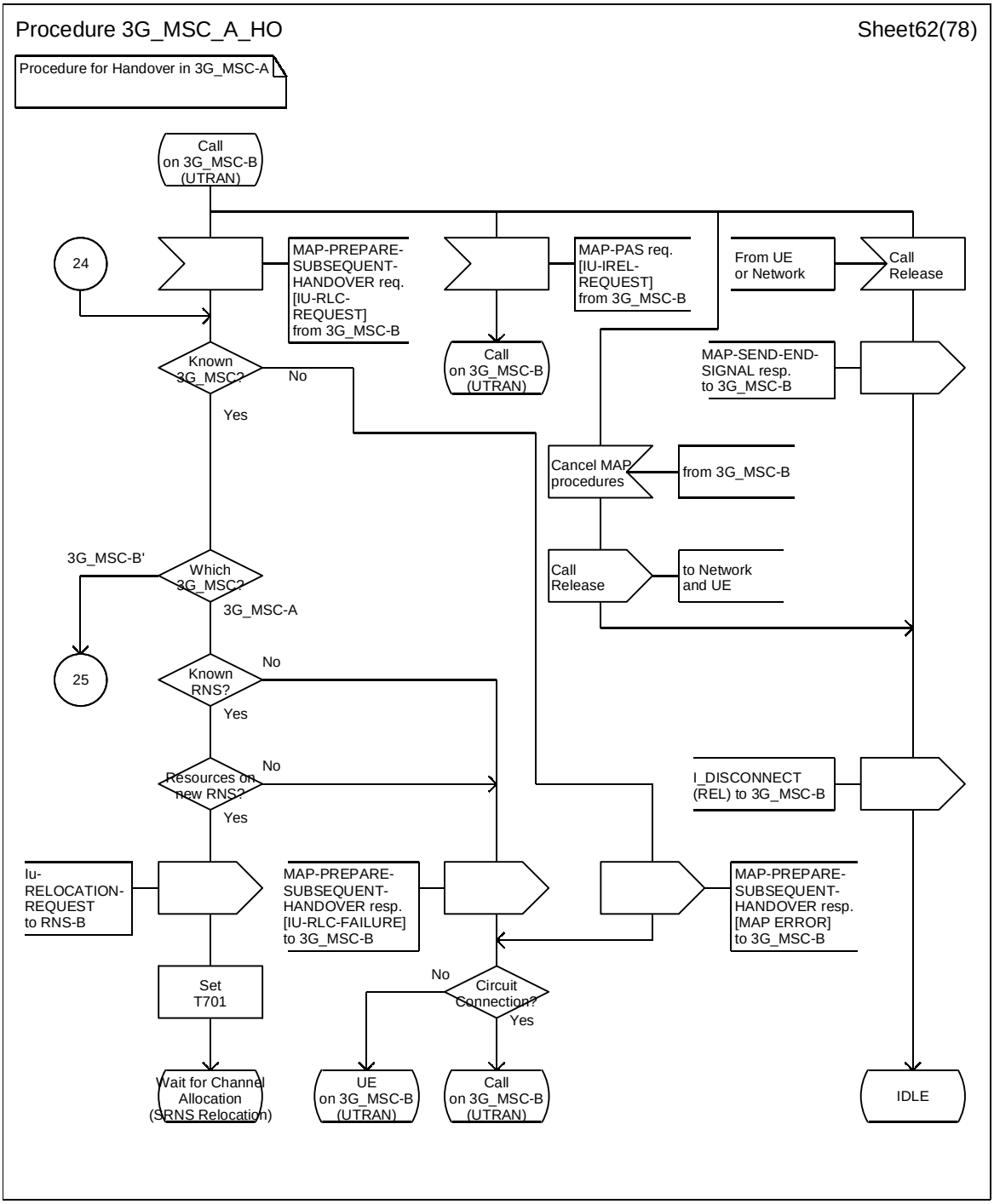

Procedure for Handover in 3G_MSC-A
Basic SRNS Relocation to 3G_MSC-B Crcuit Connection required
17
MAP-PREPARE-HANDOVER req. [Iu-RLC-REQUEST] to 3G_MSC-B
Wait For Acknowledgement from 3G_MSC-B (SRNS Relocation)
MAP-PREPARE-HANDOVER resp. [IU-RLC-REQUEST-ACK] from 3G_MSC-B
MAP-PREPARE-HANDOVER resp. [IU-RLC-FAILURE] from 3G_MSC-B
MAP-PREPARE-HANDOVER resp. [MAP ERROR] from 3G_MSC-B
Handover Number?
Not Requested
Requested
I_CONNECT (IAM) to 3G_MSC-B using Handover Number
Wait for Connection from 3G_MSC-B (SRNS Relocation)
22
16

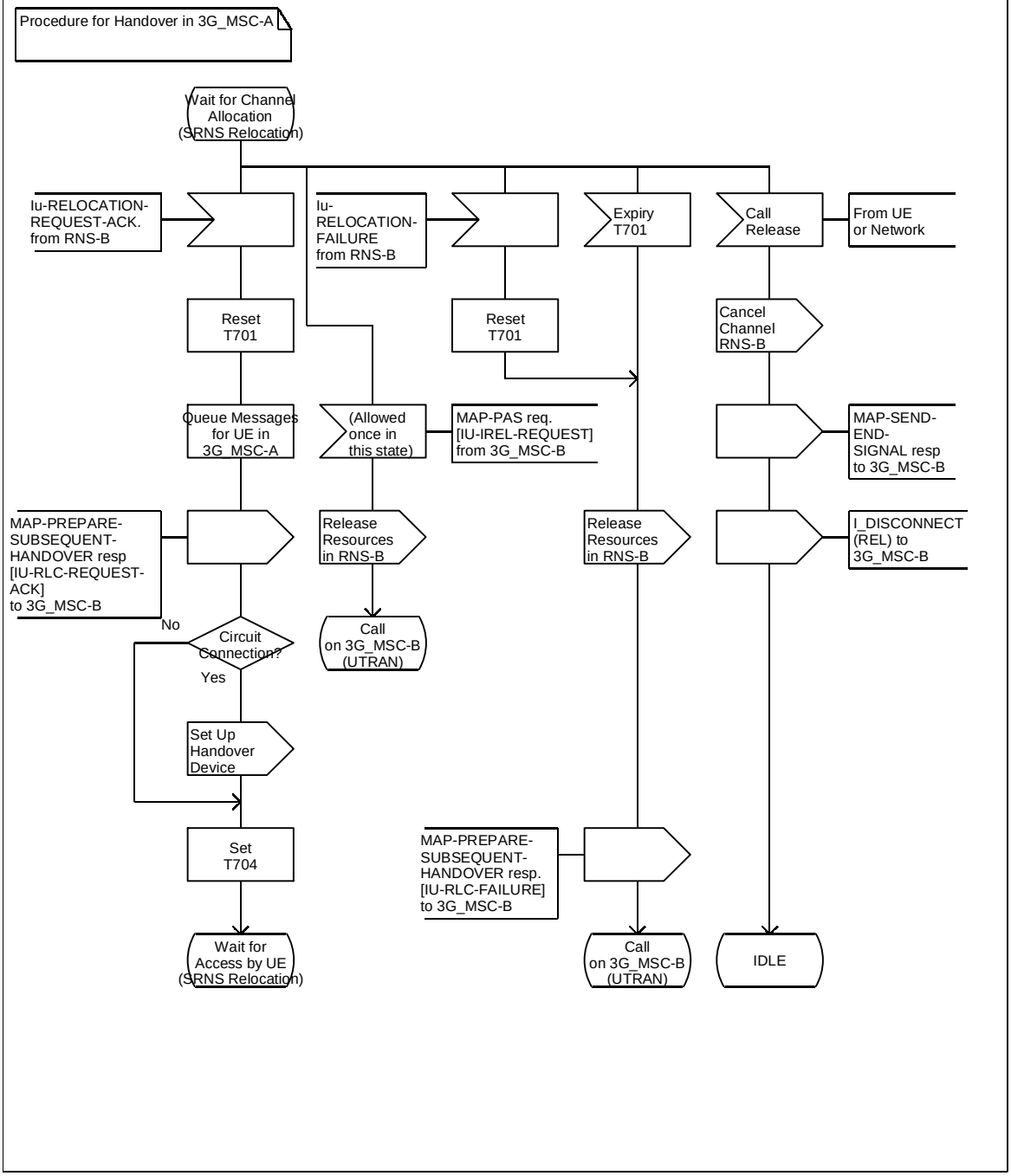

Procedure for Handover in 3G_MSC-A
Wait For Acknowledgement from 3G_MSC-B (SRNS Relocation)
ERROR
from 3G_MSC-B
Iu-RELEASE-REQUEST from RNS-A
Call Release
From UE or Network
Cancel MAP Resources
in 3G_MSC-A
to Network
Call Release
Release Resources in RNS-A
Cancel MAP Resources
to 3G_MSC-B
16
IDLE

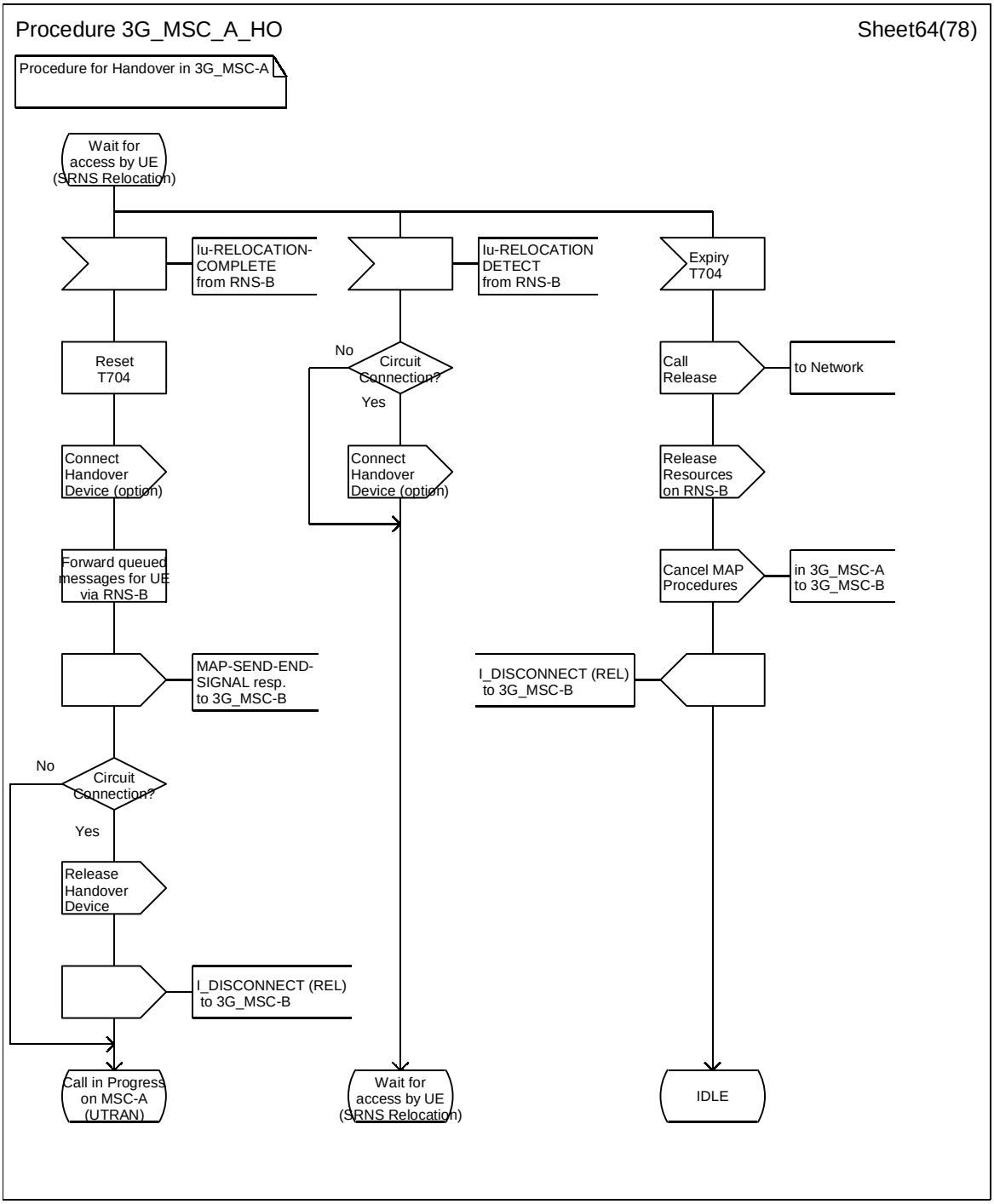

Procedure for Handover in 3G_MSC-A
Wait for Connection from 3G_MSC-B (SRNS Relocation)
I_COMPLETE (ACM) from 3G_MSC-B
Iu-RELEASE-REQUEST from RNS-A
(Allowed once in this state)
From UE or Network
Call Release
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Call Release
to UE and Network
Queue Messages for UE in 3G_MSC-A
Wait for Connection from 3G_MSC-B (SRNS Relocation)
ERROR
from 3G_MSC-B or Network
Release Resources in RNS-A
Iu-RELOCATION COMMAND to RNS-A
I_DISCONNECT (REL) to 3G_MSC-B
Set T703
to 3G_MSC-B in 3G_MSC-A
Cancel MAP Procedures
Set Up the Handover Device
Internal message in 3G_MSC-A
I_DISCONNECT (REL) to 3G_MSC-B
Wait for Completion on 3G_MSC-B (SRNS Relocation)
16
IDLE

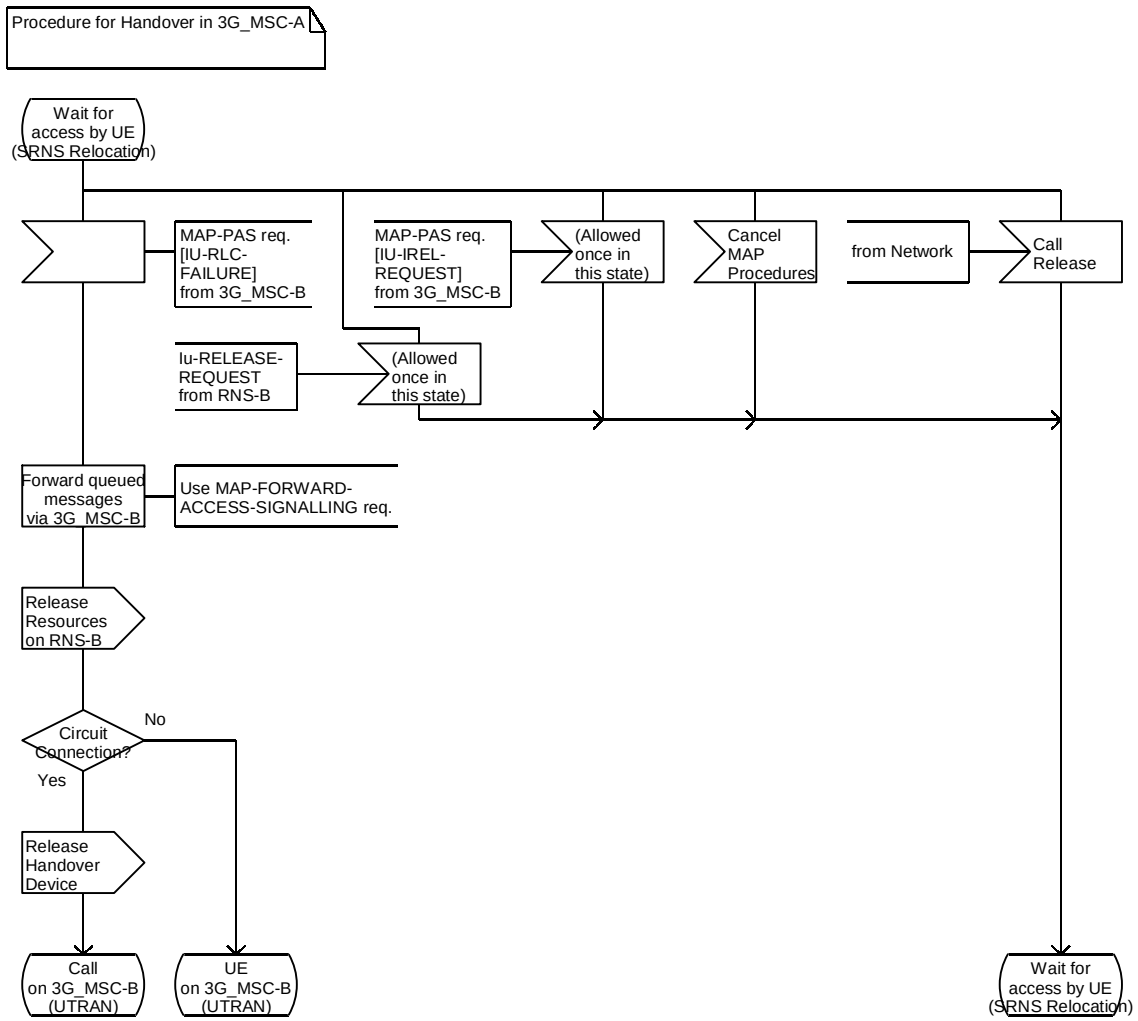

Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B (SRNS Relocation)
MAP-SEND-END-SIGNAL req. [IU-RLC-COMPLETE] from 3G_MSC-B
I-ANSWER (ANM) from 3G_MSC-B
MAP-PAS req. [IU-RLC-DETECT] from 3G_MSC-B
Reset T703
(Allowed once in this state)
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Iu-RELEASE-REQUEST from RNS-A
Release Resources on RNS-A
Connect Handover Device (option)
Yes
Wait for UE on 3G_MSC-B?
No
Wait for Completion on 3G_MSC-B (SRNS Relocation)
Call Release
to Network and UE
Forward queued messages via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req
Release MAP Resources
to 3G_MSC-B in 3G_MSC-A
Connect Handover Device (option)
Release Resources on RNS-A
I_DISCONNECT (REL) to 3G_MSC-B
Call on 3G_MSC-B (UTRAN)
IDLE
Wait for Completion on 3G_MSC-B (SRNS Relocation)

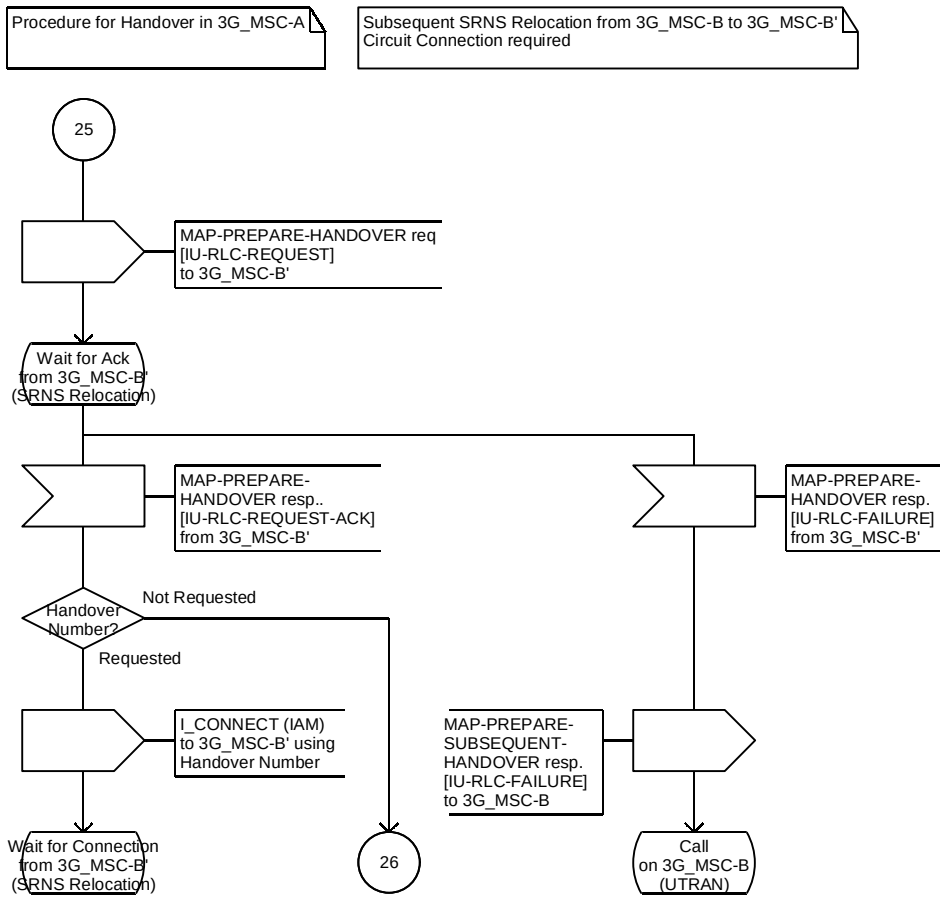

Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B (SRNS Relocation)
Iu-RELOCATION-CANCEL from RNS-A
I_DISCONNECT (REL) from 3G_MSC-B
Expiry T703
Call Release
from Network
Reset T703
Cancel MAP Procedures
In 3G_MSC-A and to 3G_MSC-B
Release Handover Device
Internal to 3G_MSC-A
Forward queued messages for UE via RNS-A
Release Handover Device
Internal to 3G_MSC-A
Wait for Completion on 3G_MSC-B (SRNS Relocation)
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-B
in 3G_MSC-A to 3G_MSC-B
Cancel MAP Procedures
from 3G_MSC-B
Cancel MAP Procedures
Cancel MAP Procedures
In 3G_MSC-A and to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B
Release Handover Device
Release Handover Device
Internal to 3G_MSC-A
I_DISCONNECT (REL) to 3G_MSC-B
Release Resources RNS-A
Call in Progress on 3G_MSC-A (UTRAN)
Wait for Completion on 3G_MSC-B (SRNS Relocation)
IDLE

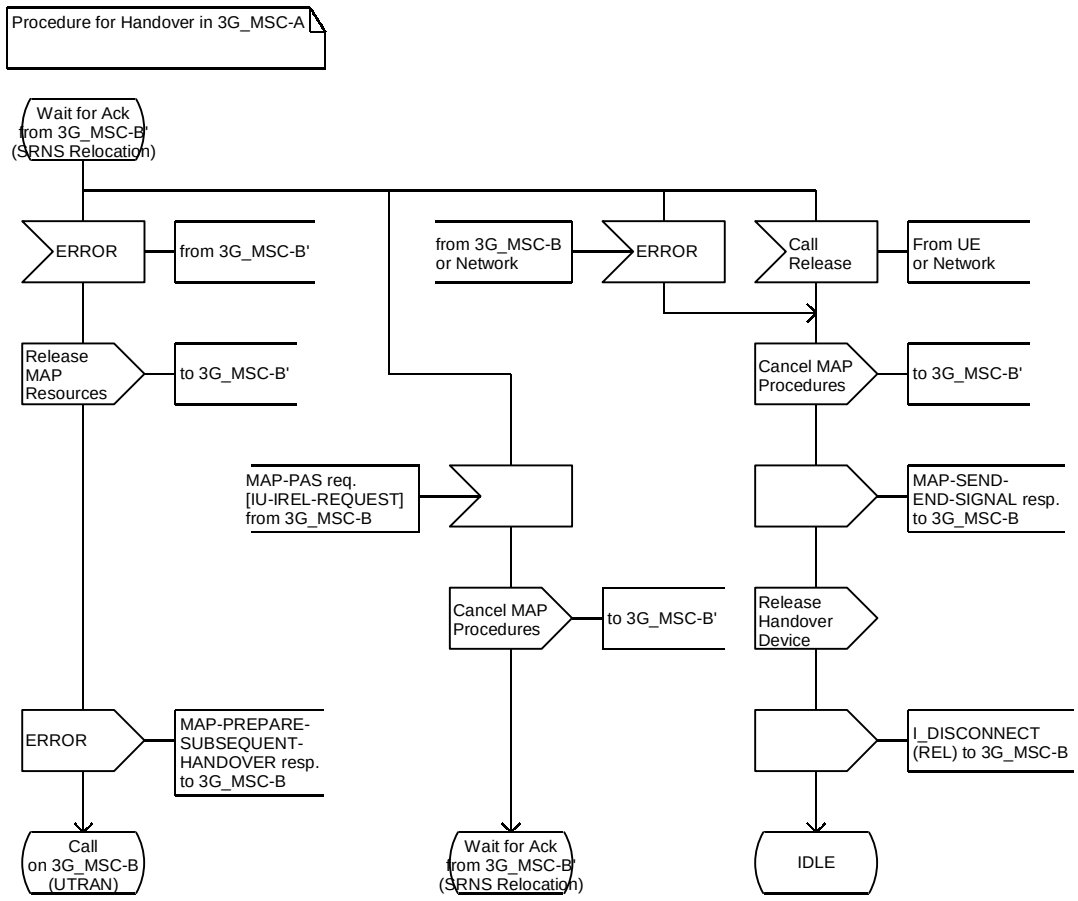

Procedure for Handover in 3G_MSC-A
Call on 3G_MSC-B (UTRAN)
24
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [IU-RLC-REQUEST] from 3G_MSC-B
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
From UE or Network
Call Release
Call on 3G_MSC-B (UTRAN)
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Known 3G_MSC?
No
Yes
Cancel MAP procedures
from 3G_MSC-B
3G_MSC-B'
Which 3G_MSC?
Call Release
to Network and UE
3G_MSC-A
25
Known RNS?
No
Yes
Resources on new RNS?
No
Yes
I_DISCONNECT (REL) to 3G_MSC-B
Iu-RELOCATION-REQUEST to RNS-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [IU-RLC-FAILURE] to 3G_MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [MAP ERROR] to 3G_MSC-B
Set T701
No
Circuit Connection?
Yes
Wait for Channel Allocation (SRNS Relocation)
UE on 3G_MSC-B (UTRAN)
Call on 3G_MSC-B (UTRAN)
IDLE

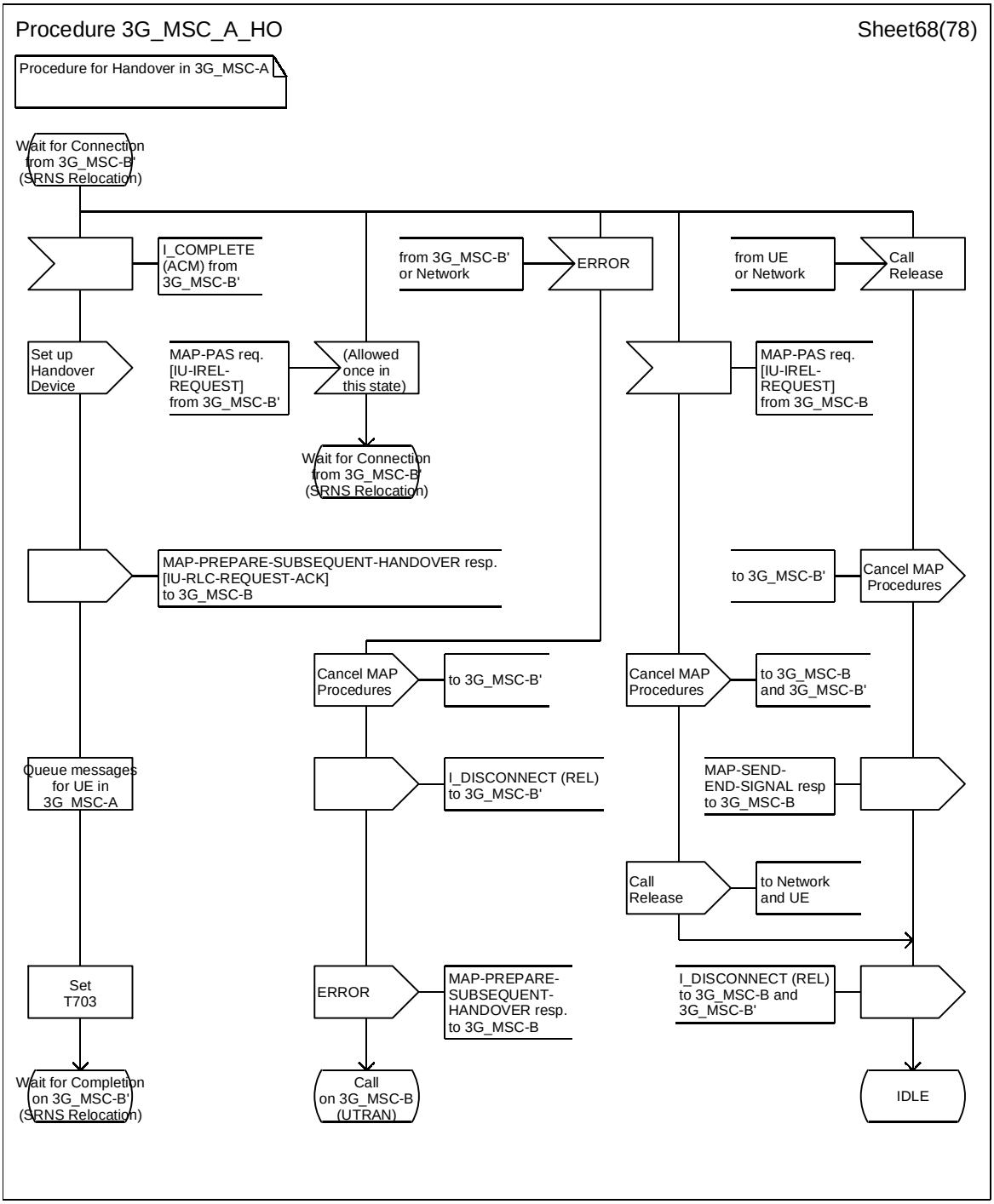

Procedure for Handover in 3G_MSC-A
Wait for Channel Allocation (SRNS Relocation)
Iu-RELOCATION-REQUEST-ACK. from RNS-B
Iu-RELOCATION-FAILURE from RNS-B
Expiry T701
Call Release
From UE or Network
Reset T701
Reset T701
Cancel Channel RNS-B
Queue Messages for UE in 3G_MSC-A
(Allowed once in this state)
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
MAP-SEND-END-SIGNAL resp to 3G_MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp [IU-RLC-REQUEST-ACK] to 3G_MSC-B
Release Resources in RNS-B
Release Resources in RNS-B
I_DISCONNECT (REL) to 3G_MSC-B
No
Circuit Connection?
Call on 3G_MSC-B (UTRAN)
Yes
Set Up Handover Device
Set T704
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [IU-RLC-FAILURE] to 3G_MSC-B
Wait for Access by UE (SRNS Relocation)
Call on 3G_MSC-B (UTRAN)
IDLE

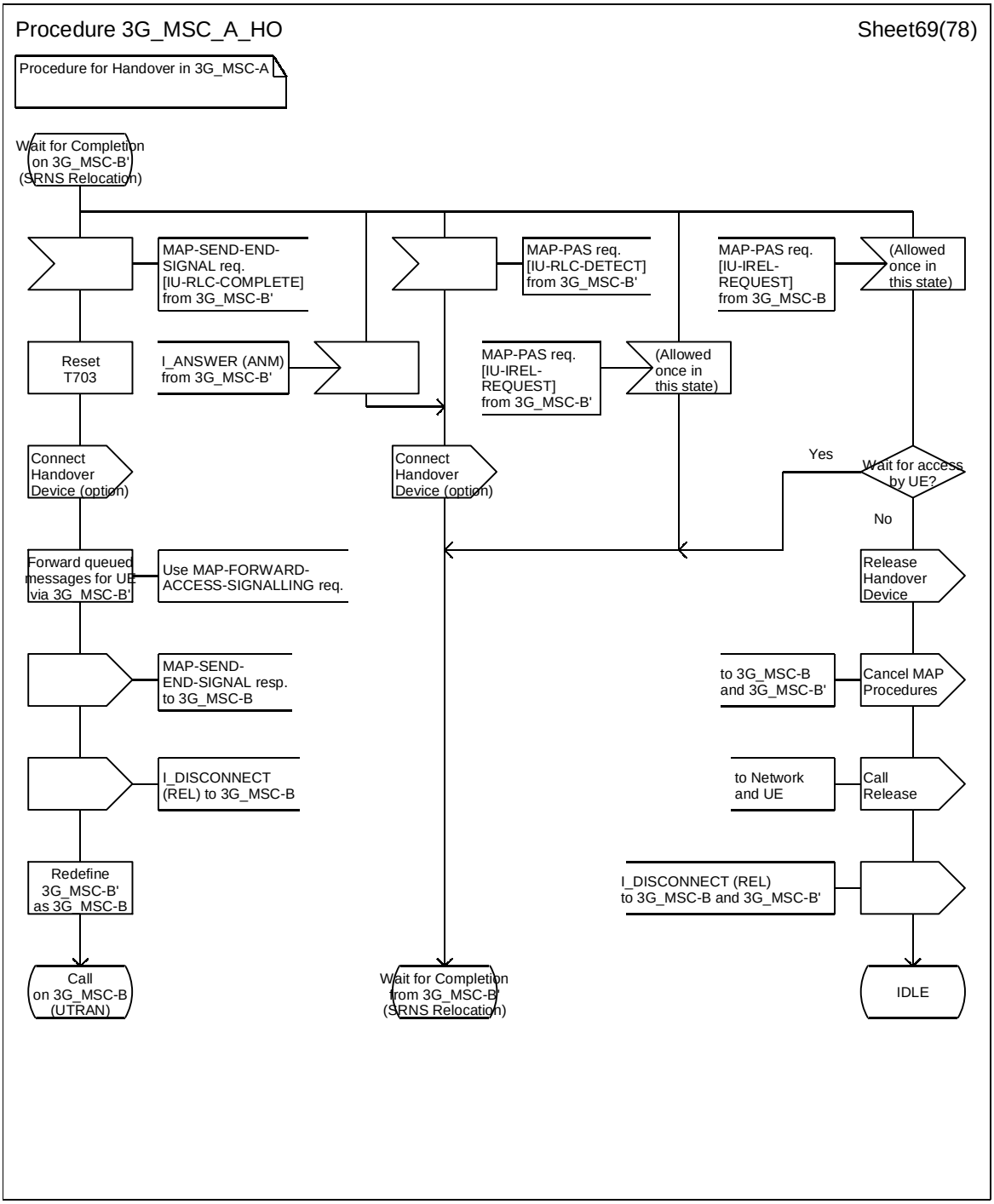

Procedure for Handover in 3G_MSC-A
Wait for access by UE (SRNS Relocation)
Iu-RELOCATION-COMPLETE from RNS-B
Iu-RELOCATION DETECT from RNS-B
Expiry T704
Reset T704
No
Circuit Connection?
Yes
Call Release
to Network
Connect Handover Device (option)
Connect Handover Device (option)
Release Resources on RNS-B
Forward queued messages for UE via RNS-B
Cancel MAP Procedures
in 3G_MSC-A to 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B
No
Circuit Connection?
Yes
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-B
Call in Progress on MSC-A (UTRAN)
Wait for access by UE (SRNS Relocation)
IDLE

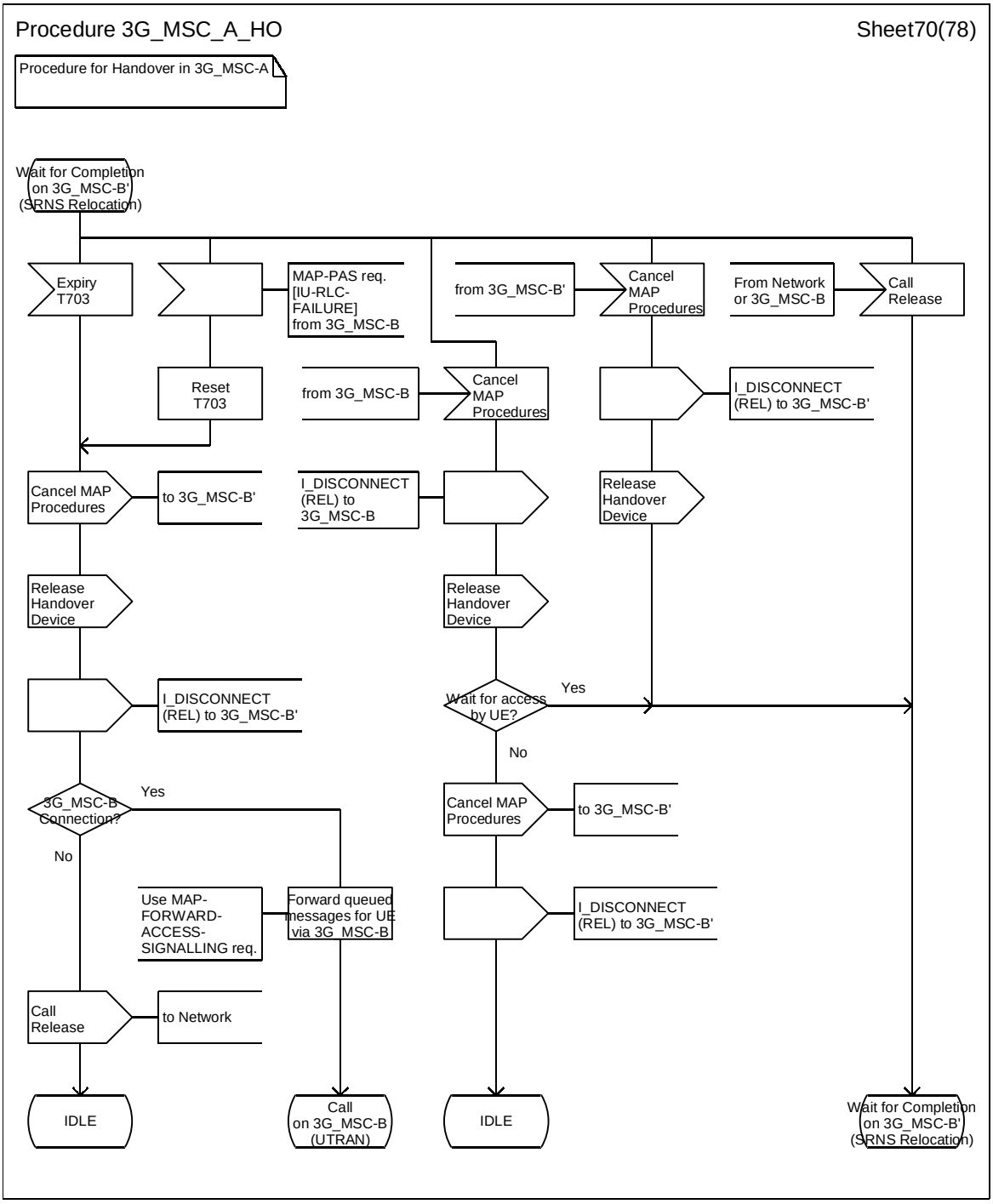

Procedure for Handover in 3G_MSC-A
Wait for access by UE (SRNS Relocation)
MAP-PAS req. [IU-RLC-FAILURE] from 3G_MSC-B
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Cancel MAP Procedures
from Network
Call Release
Iu-RELEASE-REQUEST from RNS-B
(Allowed once in this state)
Forward queued messages via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release Resources on RNS-B
Circuit Connection?
No
Yes
Release Handover Device
Call on 3G_MSC-B (UTRAN)
UE on 3G_MSC-B (UTRAN)
Wait for access by UE (SRNS Relocation)

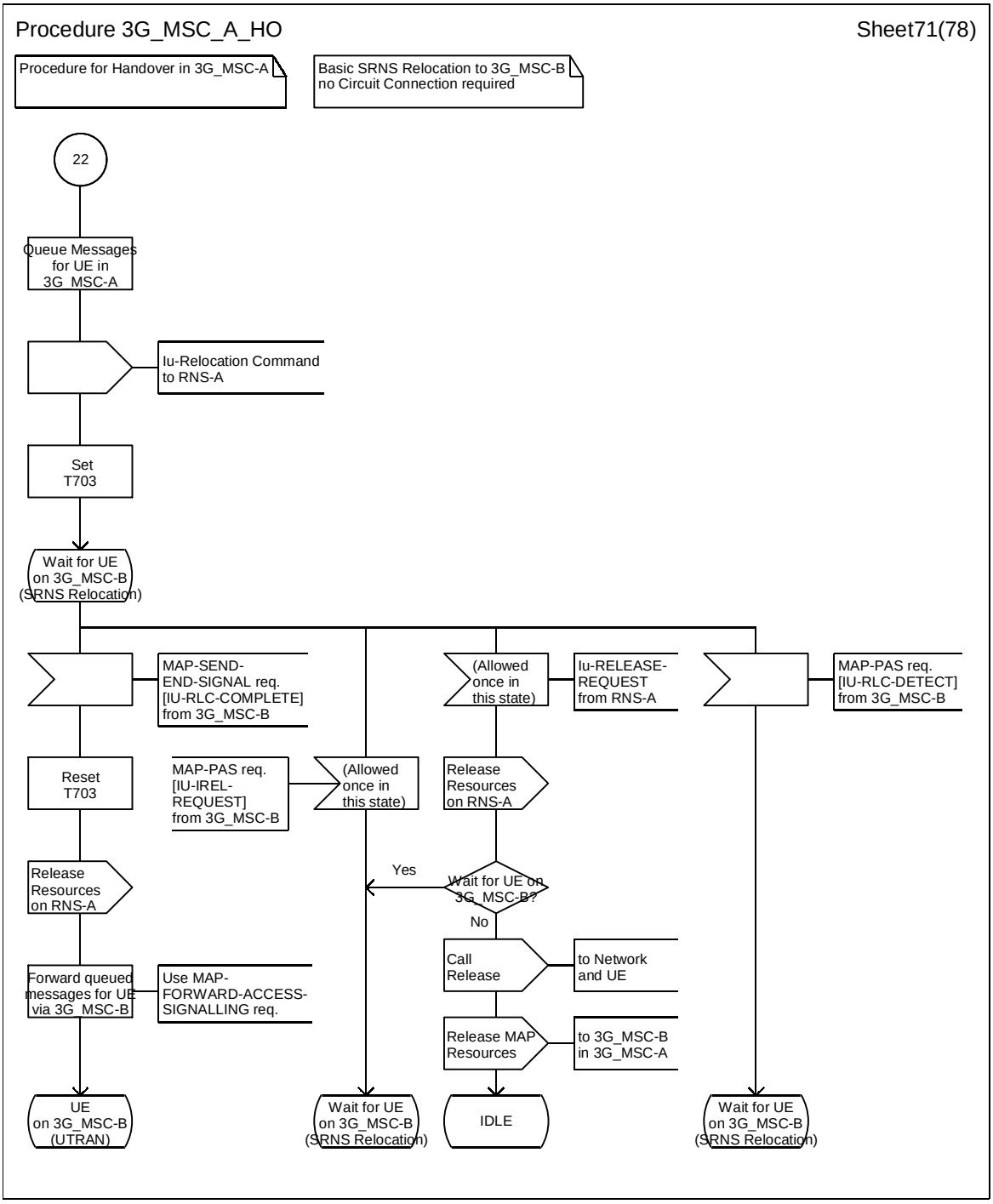

Procedure for Handover in 3G_MSC-A
Subsequent SRNS Relocation from 3G_MSC-B to 3G_MSC-B'
Circuit Connection required
25
MAP-PREPARE-HANDOVER req
[IU-RLC-REQUEST]
to 3G_MSC-B'
Wait for Ack
from 3G_MSC-B'
(SRNS Relocation)
MAP-PREPARE-
HANDOVER resp..
[IU-RLC-REQUEST-ACK]
from 3G_MSC-B'
MAP-PREPARE-
HANDOVER resp.
[IU-RLC-FAILURE]
from 3G_MSC-B'
Handover
Number?
Not Requested
Requested
I_CONNECT (IAM)
to 3G_MSC-B' using
Handover Number
MAP-PREPARE-
SUBSEQUENT-
HANDOVER resp.
[IU-RLC-FAILURE]
to 3G_MSC-B
Wait for Connection
from 3G_MSC-B'
(SRNS Relocation)
26
Call
on 3G_MSC-B
(UTRAN)

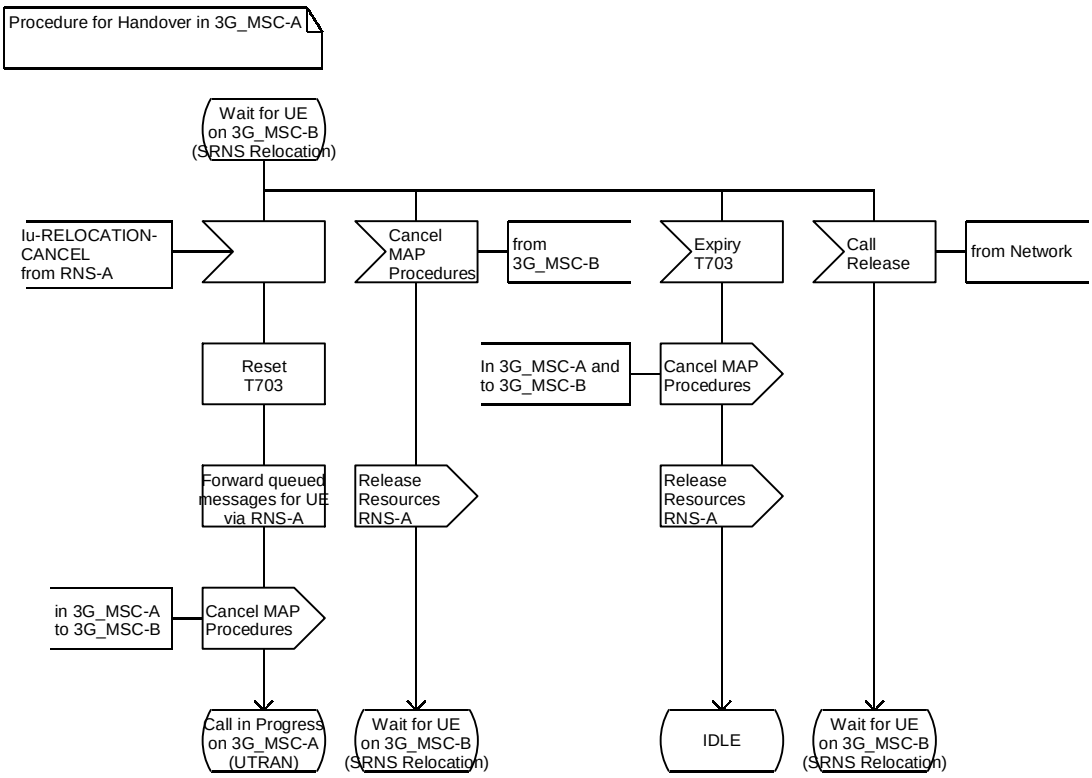

Procedure for Handover in 3G_MSC-A
Wait for Ack from 3G_MSC-B' (SRNS Relocation)
ERROR
from 3G_MSC-B'
from 3G_MSC-B or Network
ERROR
Call Release
From UE or Network
Release MAP Resources
to 3G_MSC-B'
Cancel MAP Procedures
to 3G_MSC-B'
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Cancel MAP Procedures
to 3G_MSC-B'
Release Handover Device
ERROR
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B
Call on 3G_MSC-B (UTRAN)
Wait for Ack from 3G_MSC-B' (SRNS Relocation)
IDLE

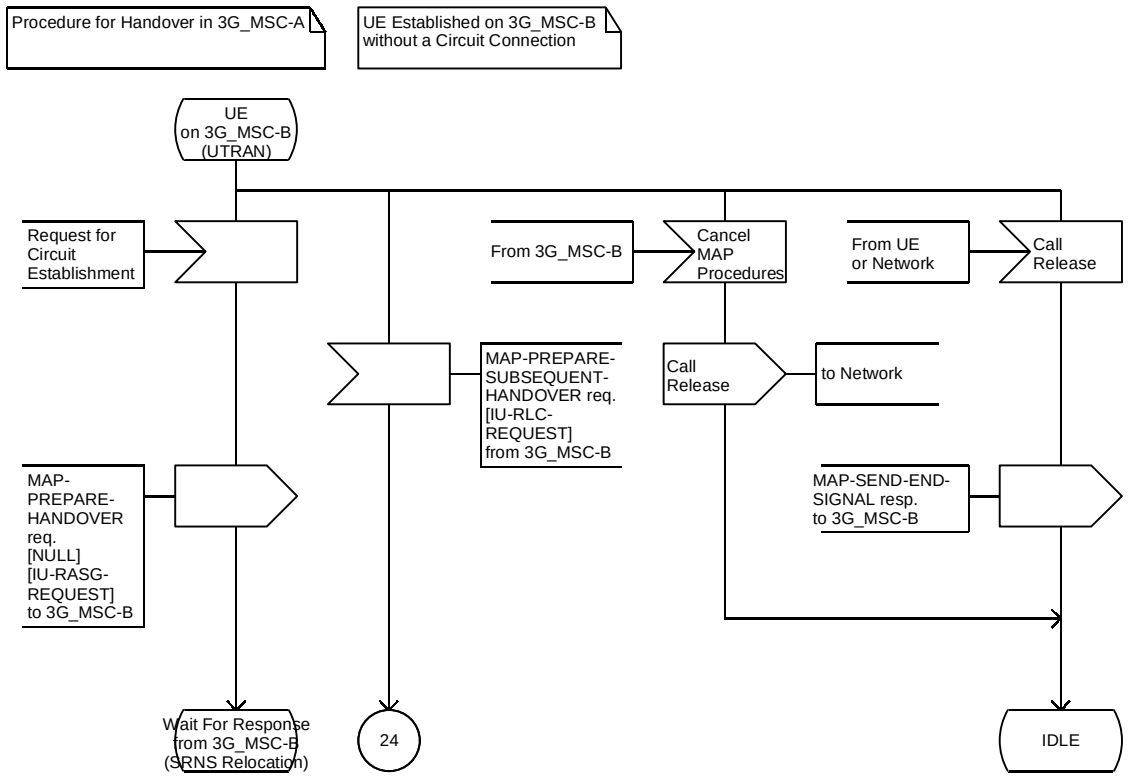

Procedure for Handover in 3G_MSC-A
Wait for Connection from 3G_MSC-B' (SRNS Relocation)
I_COMPLETE (ACM) from 3G_MSC-B'
from 3G_MSC-B' or Network
ERROR
from UE or Network
Call Release
Set up Handover Device
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B'
(Allowed once in this state)
Wait for Connection from 3G_MSC-B' (SRNS Relocation)
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [IU-RLC-REQUEST-ACK] to 3G_MSC-B
to 3G_MSC-B'
Cancel MAP Procedures
Cancel MAP Procedures
to 3G_MSC-B'
Cancel MAP Procedures
to 3G_MSC-B and 3G_MSC-B'
Queue messages for UE in 3G_MSC-A
I_DISCONNECT (REL) to 3G_MSC-B'
MAP-SEND-END-SIGNAL resp to 3G_MSC-B
Call Release
to Network and UE
Set T703
ERROR
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. to 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B and 3G_MSC-B'
Wait for Completion on 3G_MSC-B' (SRNS Relocation)
Call on 3G_MSC-B (UTRAN)
IDLE

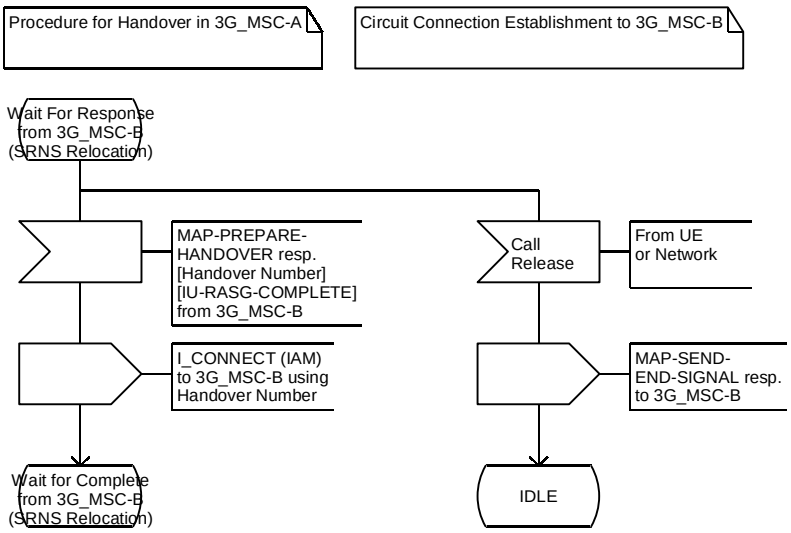

Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B' (SRNS Relocation)
MAP-SEND-END-SIGNAL req. [IU-RLC-COMPLETE] from 3G_MSC-B'
MAP-PAS req. [IU-RLC-DETECT] from 3G_MSC-B'
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Reset T703
I_ANSWER (ANM) from 3G_MSC-B'
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B'
(Allowed once in this state)
Yes
Wait for access by UE?
No
Connect Handover Device (option)
Connect Handover Device (option)
Forward queued messages for UE via 3G_MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release Handover Device
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
to 3G_MSC-B and 3G_MSC-B'
Cancel MAP Procedures
I_DISCONNECT (REL) to 3G_MSC-B
to Network and UE
Call Release
Redefine 3G_MSC-B' as 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B and 3G_MSC-B'
Call on 3G_MSC-B (UTRAN)
Wait for Completion from 3G_MSC-B' (SRNS Relocation)
IDLE

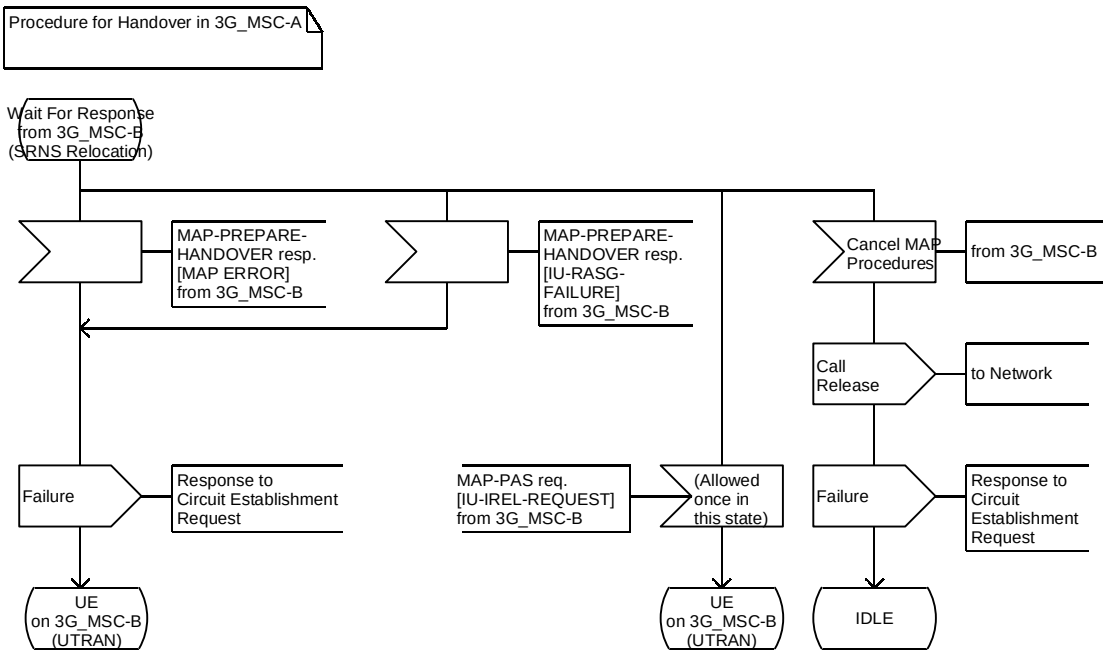

Procedure for Handover in 3G_MSC-A
Wait for Completion on 3G_MSC-B' (SRNS Relocation)
Expiry T703
MAP-PAS req. [IU-RLC-FAILURE] from 3G_MSC-B
from 3G_MSC-B'
Cancel MAP Procedures
From Network or 3G_MSC-B
Call Release
Reset T703
from 3G_MSC-B
Cancel MAP Procedures
I_DISCONNECT (REL) to 3G_MSC-B'
Cancel MAP Procedures
to 3G_MSC-B'
I_DISCONNECT (REL) to 3G_MSC-B
Release Handover Device
Release Handover Device
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-B'
Wait for access by UE?
Yes
No
3G_MSC-B Connection?
Yes
No
Cancel MAP Procedures
to 3G_MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Forward queued messages for UE via 3G_MSC-B
I_DISCONNECT (REL) to 3G_MSC-B'
Call Release
to Network
IDLE
Call on 3G_MSC-B (UTRAN)
IDLE
Wait for Completion on 3G_MSC-B' (SRNS Relocation)

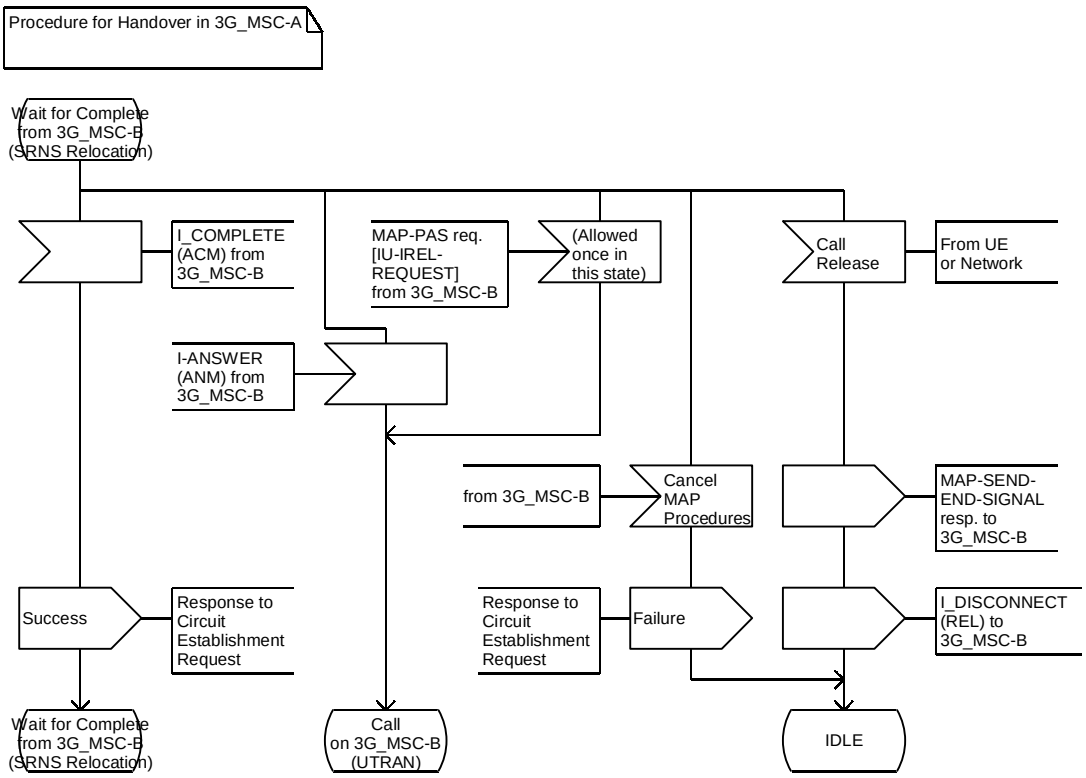

Procedure for Handover in 3G_MSC-A
Basic SRNS Relocation to 3G_MSC-B no Circuit Connection required
22
Queue Messages for UE in 3G_MSC-A
Iu-Relocation Command to RNS-A
Set T703
Wait for UE on 3G_MSC-B (SRNS Relocation)
MAP-SEND-END-SIGNAL req. [IU-RLC-COMPLETE] from 3G_MSC-B
(Allowed once in this state)
Iu-RELEASE-REQUEST from RNS-A
MAP-PAS req. [IU-RLC-DETECT] from 3G_MSC-B
Reset T703
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Release Resources on RNS-A
Yes
Wait for UE on 3G_MSC-B?
No
Release Resources on RNS-A
Call Release
to Network and UE
Forward queued messages for UE via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Release MAP Resources
to 3G_MSC-B in 3G_MSC-A
UE on 3G_MSC-B (UTRAN)
Wait for UE on 3G_MSC-B (SRNS Relocation)
IDLE
Wait for UE on 3G_MSC-B (SRNS Relocation)

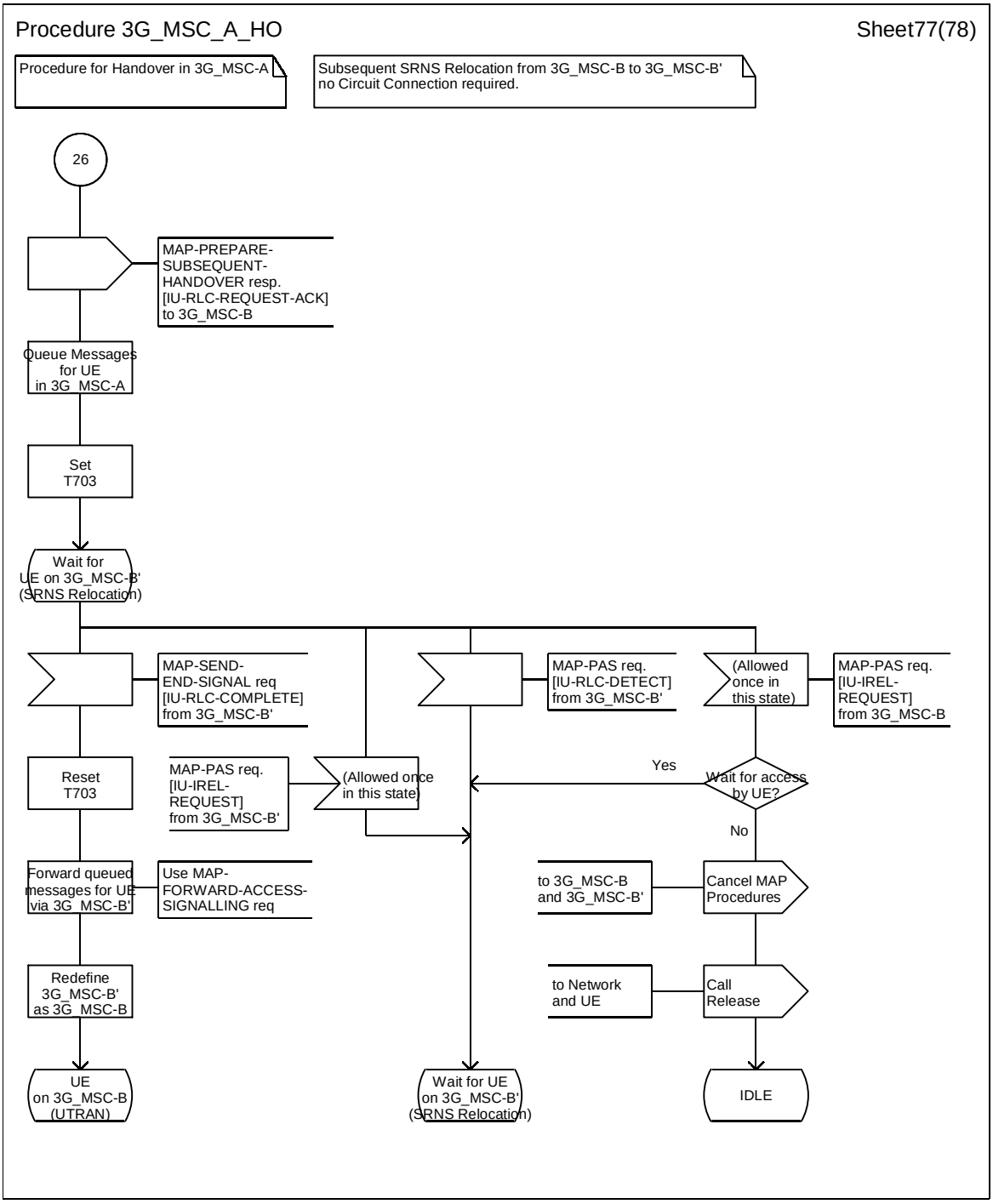

Procedure for Handover in 3G_MSC-A
Wait for UE on 3G_MSC-B (SRNS Relocation)
Iu-RELOCATION-CANCEL from RNS-A
Cancel MAP Procedures
from 3G_MSC-B
Expiry T703
Call Release
from Network
Reset T703
In 3G_MSC-A and to 3G_MSC-B
Cancel MAP Procedures
Forward queued messages for UE via RNS-A
Release Resources RNS-A
Release Resources RNS-A
in 3G_MSC-A to 3G_MSC-B
Cancel MAP Procedures
Call in Progress on 3G_MSC-A (UTRAN)
Wait for UE on 3G_MSC-B (SRNS Relocation)
IDLE
Wait for UE on 3G_MSC-B (SRNS Relocation)

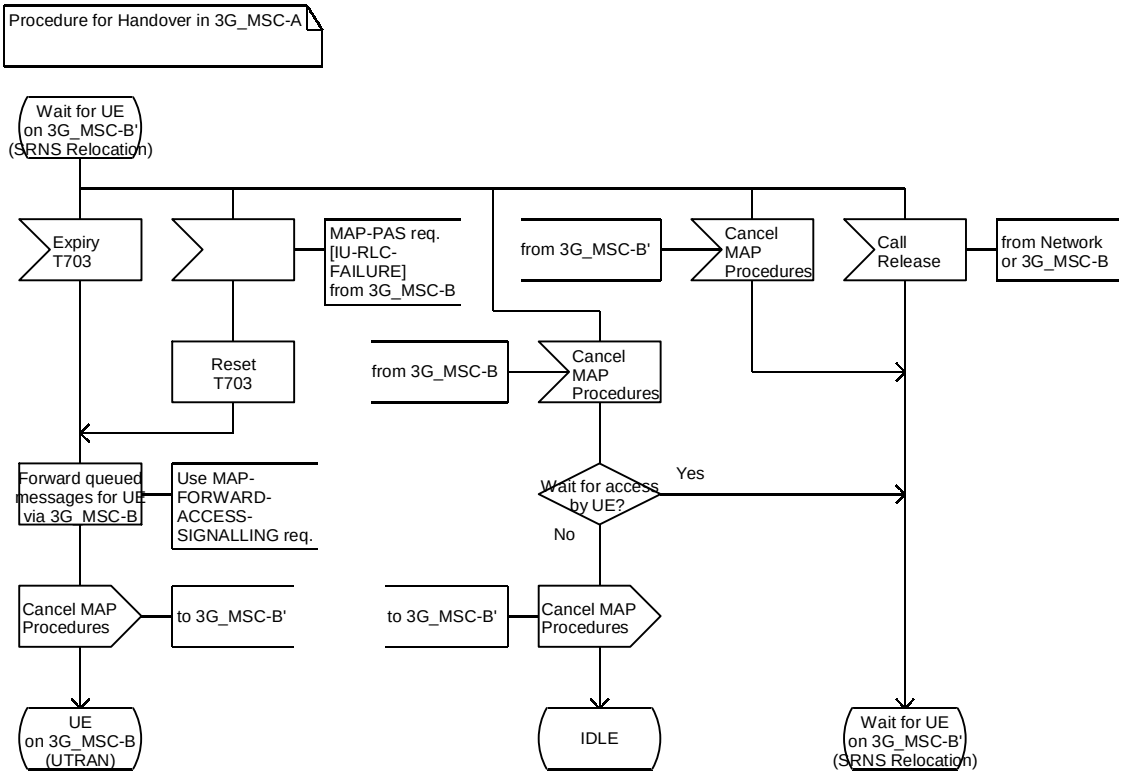

Procedure for Handover in 3G_MSC-A
UE Established on 3G_MSC-B without a Circuit Connection
UE on 3G_MSC-B (UTRAN)
Request for Circuit Establishment
From 3G_MSC-B
Cancel MAP Procedures
From UE or Network
Call Release
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [IU-RLC-REQUEST] from 3G_MSC-B
Call Release
to Network
MAP-PREPARE-HANDOVER req. [NULL] [IU-RASG-REQUEST] to 3G_MSC-B
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Wait For Response from 3G_MSC-B (SRNS Relocation)
24
IDLE


Procedure for Handover in 3G_MSC-A
Circuit Connection Establishment to 3G_MSC-B
Wait For Response from 3G_MSC-B (SRNS Relocation)
MAP-PREPARE-HANDOVER resp. [Handover Number] [IU-RASG-COMPLETE] from 3G_MSC-B
I_CONNECT (IAM) to 3G_MSC-B using Handover Number
Wait for Complete from 3G_MSC-B (SRNS Relocation)
Call Release
From UE or Network
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
IDLE


Procedure for Handover in 3G_MSC-A
Wait For Response from 3G_MSC-B (SRNS Relocation)
MAP-PREPARE-HANDOVER resp. [MAP ERROR] from 3G_MSC-B
MAP-PREPARE-HANDOVER resp. [IU-RASG-FAILURE] from 3G_MSC-B
Cancel MAP Procedures
from 3G_MSC-B
Call Release
to Network
Failure
Response to Circuit Establishment Request
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Failure
Response to Circuit Establishment Request
UE on 3G_MSC-B (UTRAN)
UE on 3G_MSC-B (UTRAN)
IDLE


Procedure for Handover in 3G_MSC-A
Wait for Complete from 3G_MSC-B (SRNS Relocation)
I_COMPLETE (ACM) from 3G_MSC-B
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
(Allowed once in this state)
Call Release
From UE or Network
I-ANSWER (ANM) from 3G_MSC-B
from 3G_MSC-B
Cancel MAP Procedures
MAP-SEND-END-SIGNAL resp. to 3G_MSC-B
Success
Response to Circuit Establishment Request
Response to Circuit Establishment Request
Failure
I_DISCONNECT (REL) to 3G_MSC-B
Wait for Complete from 3G_MSC-B (SRNS Relocation)
Call on 3G_MSC-B (UTRAN)
IDLE


Procedure for Handover in 3G_MSC-A
Subsequent SRNS Relocation from 3G_MSC-B to 3G_MSC-B'
no Circuit Connection required.
26
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [IU-RLC-REQUEST-ACK] to 3G_MSC-B
Queue Messages for UE in 3G_MSC-A
Set T703
Wait for UE on 3G_MSC-B' (SRNS Relocation)
MAP-SEND-END-SIGNAL req [IU-RLC-COMPLETE] from 3G_MSC-B'
MAP-PAS req. [IU-RLC-DETECT] from 3G_MSC-B'
(Allowed once in this state)
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B
Reset T703
MAP-PAS req. [IU-IREL-REQUEST] from 3G_MSC-B'
(Allowed once in this state)
Yes
Wait for access by UE?
No
Forward queued messages for UE via 3G_MSC-B'
Use MAP-FORWARD-ACCESS-SIGNALLING req
to 3G_MSC-B and 3G_MSC-B'
Cancel MAP Procedures
Redefine 3G_MSC-B' as 3G_MSC-B
to Network and UE
Call Release
UE on 3G_MSC-B (UTRAN)
Wait for UE on 3G_MSC-B' (SRNS Relocation)
IDLE


Procedure for Handover in 3G_MSC-A
Wait for UE on 3G_MSC-B' (SRNS Relocation)
Expiry T703
MAP-PAS req. [IU-RLC-FAILURE] from 3G_MSC-B
from 3G_MSC-B'
Cancel MAP Procedures
Call Release
from Network or 3G_MSC-B
Reset T703
from 3G_MSC-B
Cancel MAP Procedures
Forward queued messages for UE via 3G_MSC-B
Use MAP-FORWARD-ACCESS-SIGNALLING req.
Wait for access by UE?
Yes
No
Cancel MAP Procedures
to 3G_MSC-B'
to 3G_MSC-B'
Cancel MAP Procedures
UE on 3G_MSC-B (UTRAN)
IDLE
Wait for UE on 3G_MSC-B' (SRNS Relocation)

3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

***Document* N1-000608**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.009	CR	010	Current Version:	3.2.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-N #8	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [ ] UTRAN / Radio [ ] Core Network [X]

Source: Telelogic, Ericsson **Date:** 2000/05/22

Subject: Clean-up of 3G_MSC-B_HO SDLs

Work item: GSM / UMTS Interworking

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

General clean-up:
Sheet 8: Box 3, added "(GSM to UMTS HO)".
Sheet 9: Last branch, box 4, BSS-B changed to RNS-B.
Sheet 26: Branch 1, box 1, the left box should be empty.
Sheet 26: Branch 1, box 4, the text used in other similar places is "Handover Command to UE/MS via Iu-Relocation-Command to RNS-A".
Sheet 26: Branch 3, box 2, the timer changed from T201 to T401.
Sheet 44: Branch 1, box 1, the left box should be empty.
Sheet 50: First box, MS should be UE.

Clauses affected:

Other specs affected:

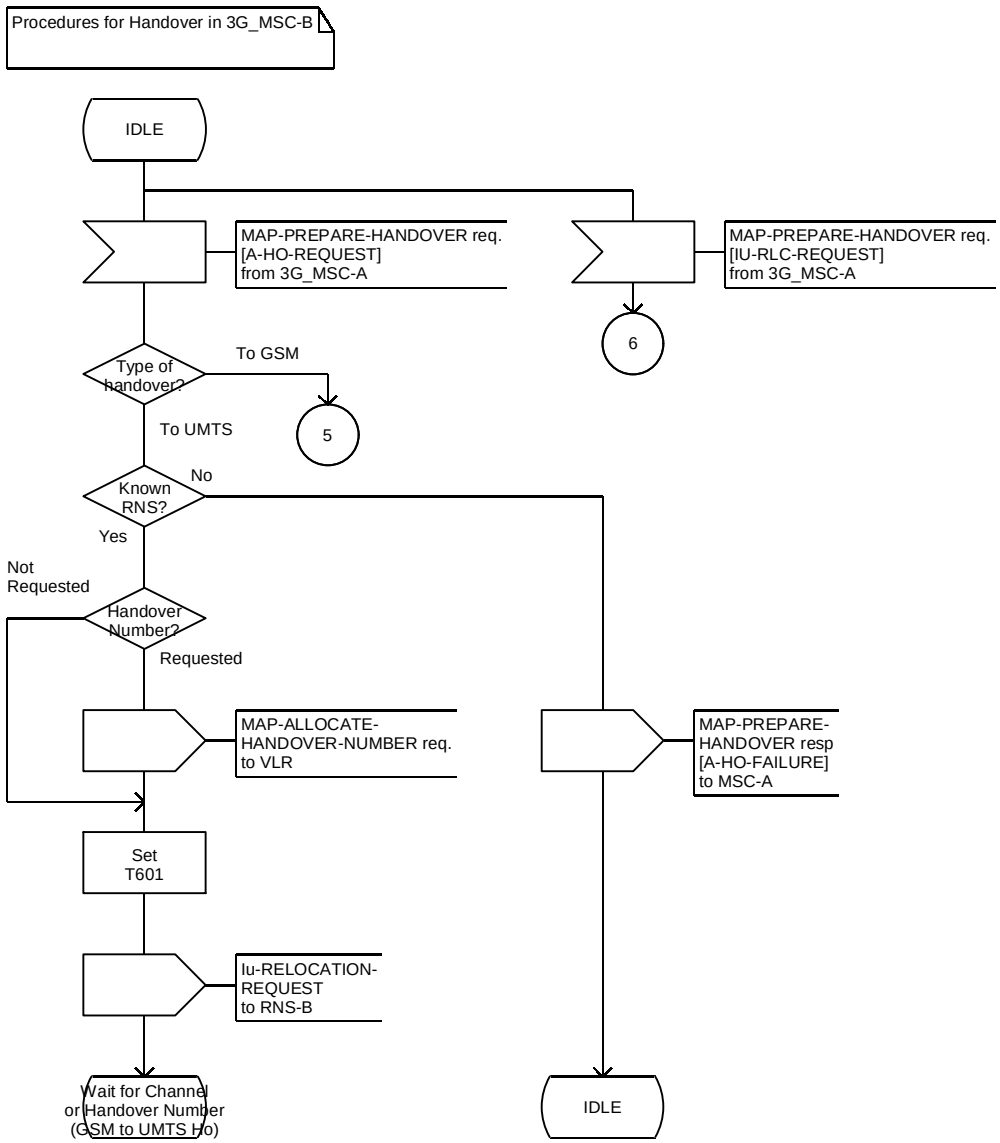
Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

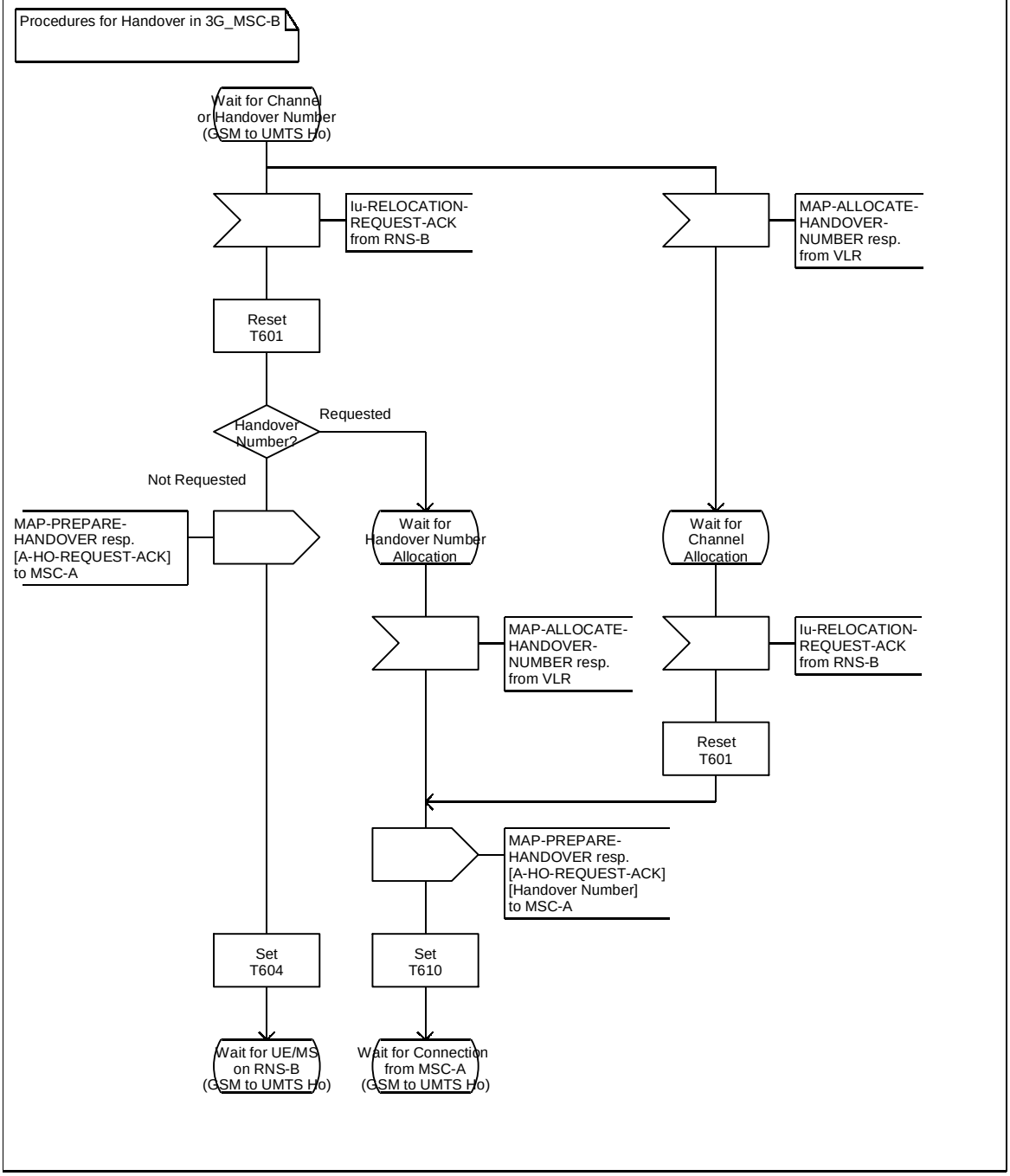
Other comments:

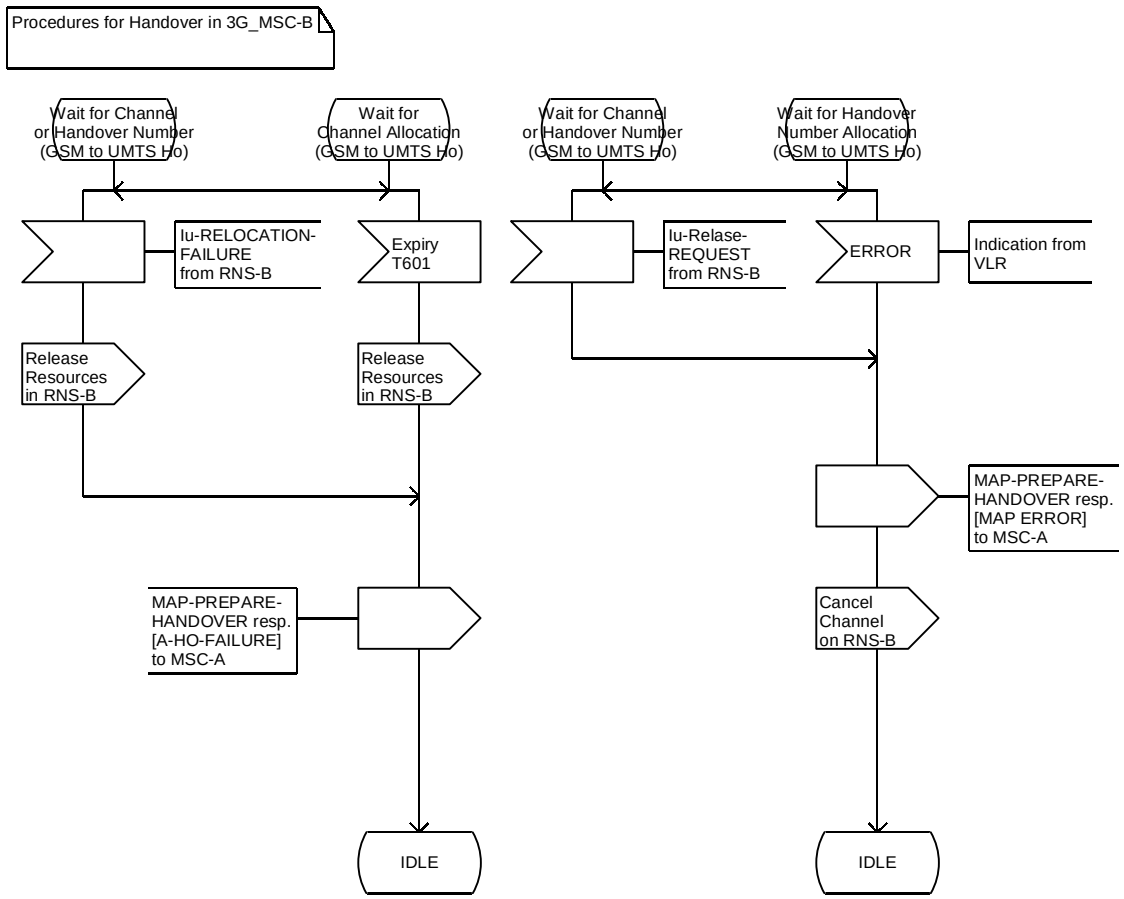
help.doc

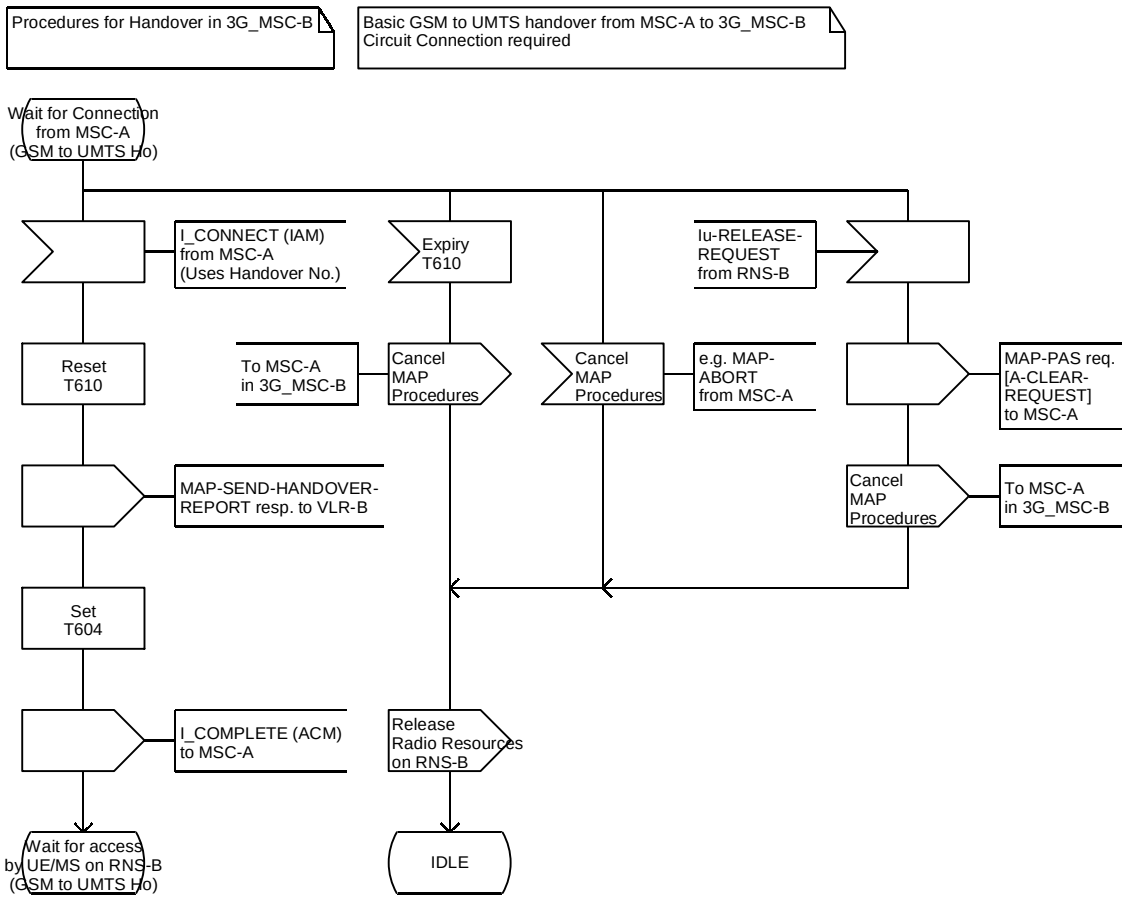
<--------- double-click here for help and instructions on how to create a CR.

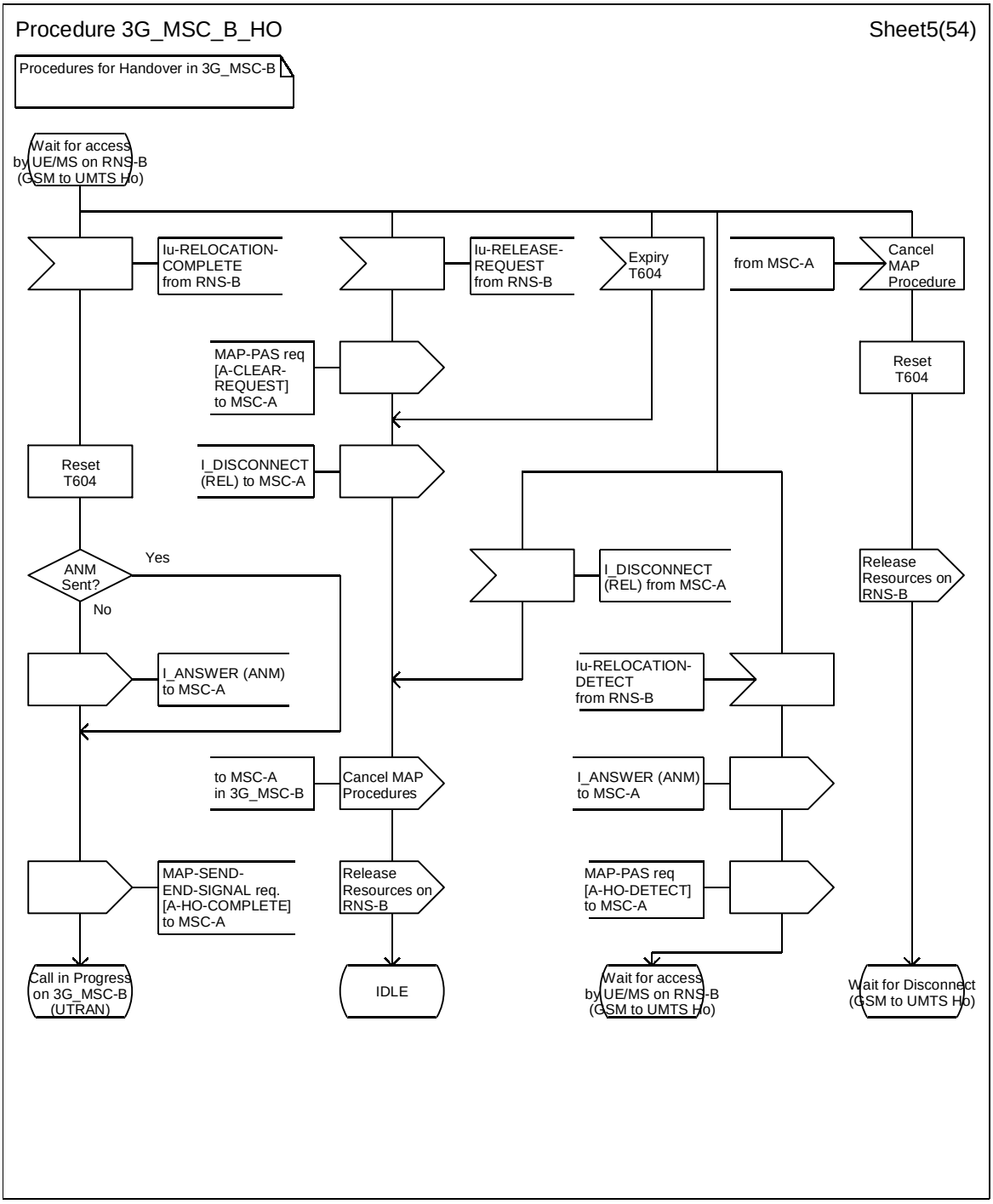
Procedure 3G_MSC_B_HO

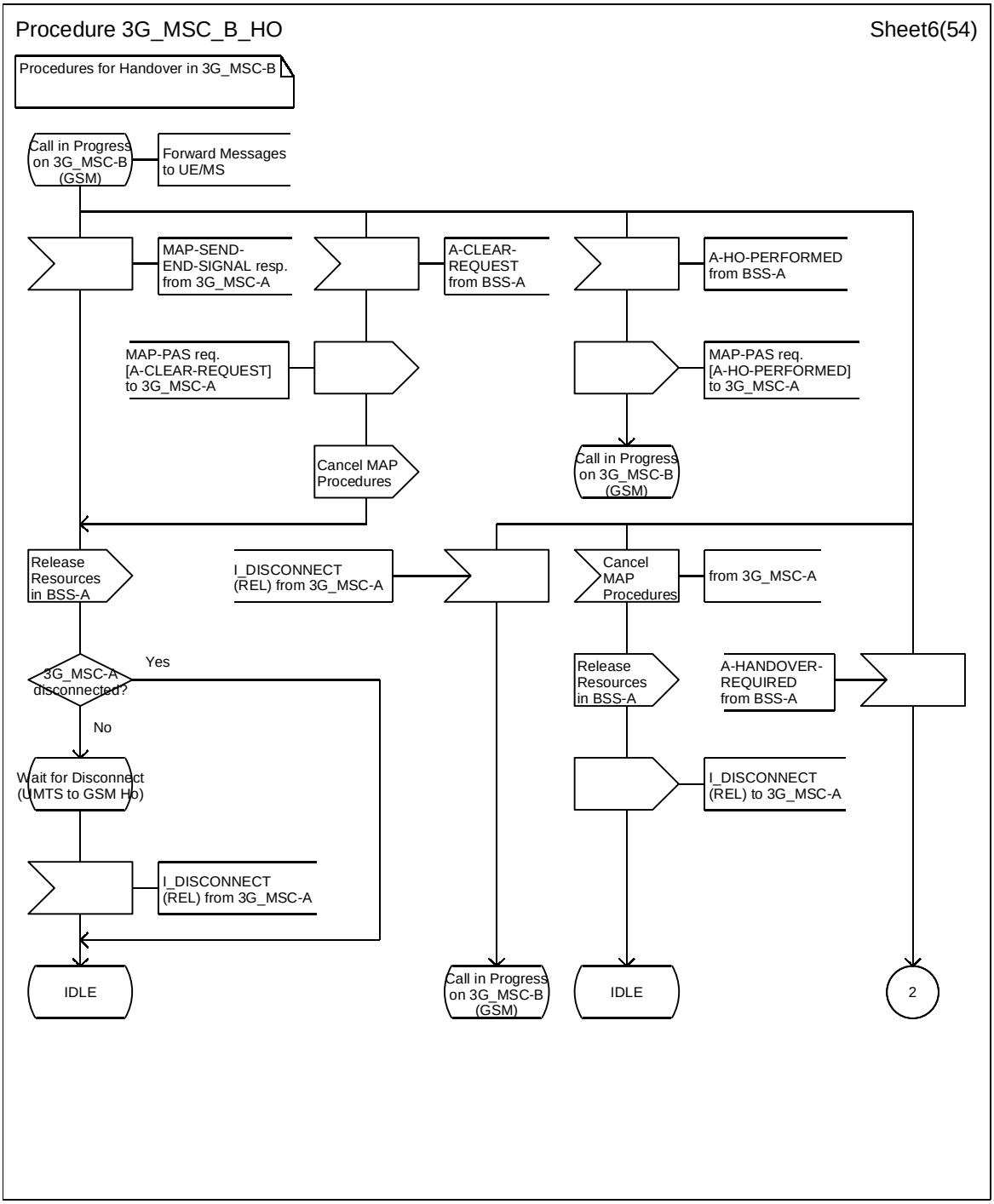


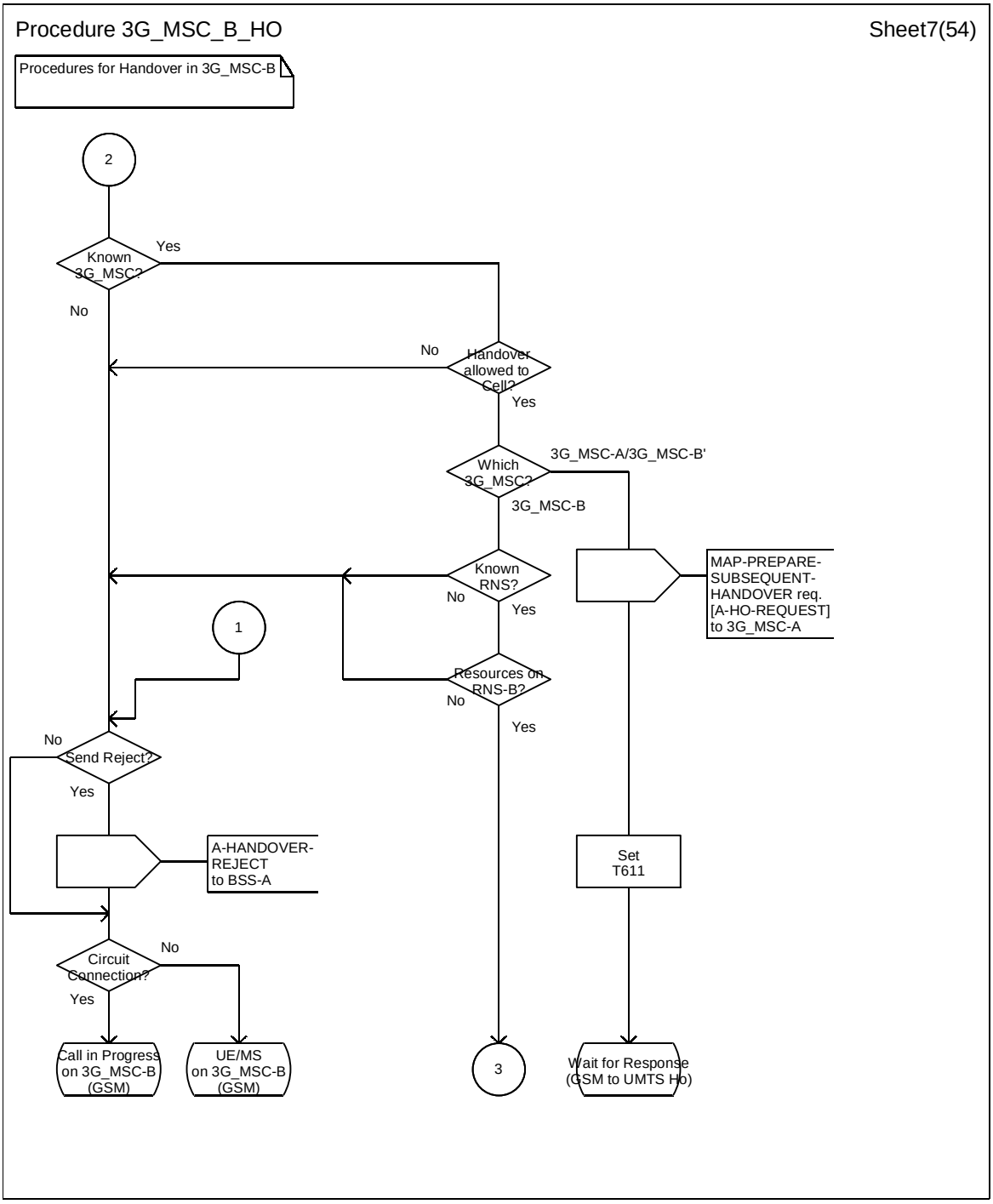

Procedures for Handover in 3G_MSC-B
Wait for Channel or Handover Number (GSM to UMTS Ho)
Iu-RELOCATION-REQUEST-ACK from RNS-B
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Reset T601
Handover Number?
Requested
Not Requested
MAP-PREPARE-HANDOVER resp. [A-HO-REQUEST-ACK] to MSC-A
Wait for Handover Number Allocation
Wait for Channel Allocation
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Iu-RELOCATION-REQUEST-ACK from RNS-B
Reset T601
MAP-PREPARE-HANDOVER resp. [A-HO-REQUEST-ACK] [Handover Number] to MSC-A
Set T604
Set T610
Wait for UE/MS on RNS-B (GSM to UMTS Ho)
Wait for Connection from MSC-A (GSM to UMTS Ho)

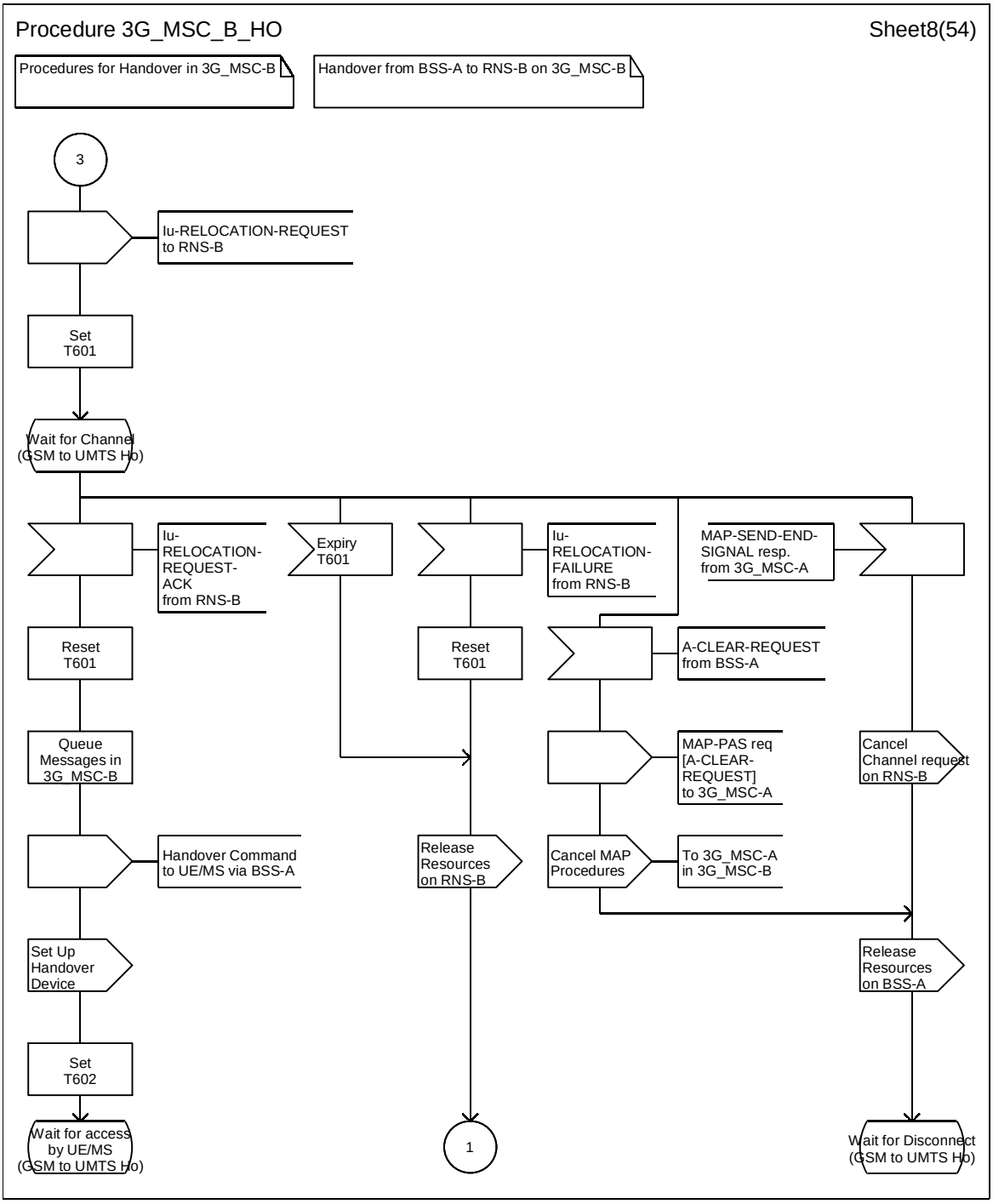

Procedures for Handover in 3G_MSC-B
Wait for Channel or Handover Number (GSM to UMTS Ho)
Wait for Channel Allocation (GSM to UMTS Ho)
Wait for Channel or Handover Number (GSM to UMTS Ho)
Wait for Handover Number Allocation (GSM to UMTS Ho)
Iu-RELOCATION-FAILURE from RNS-B
Expiry T601
Iu-Relase-REQUEST from RNS-B
ERROR
Indication from VLR
Release Resources in RNS-B
Release Resources in RNS-B
MAP-PREPARE-HANDOVER resp. [MAP ERROR] to MSC-A
MAP-PREPARE-HANDOVER resp. [A-HO-FAILURE] to MSC-A
Cancel Channel on RNS-B
IDLE
IDLE

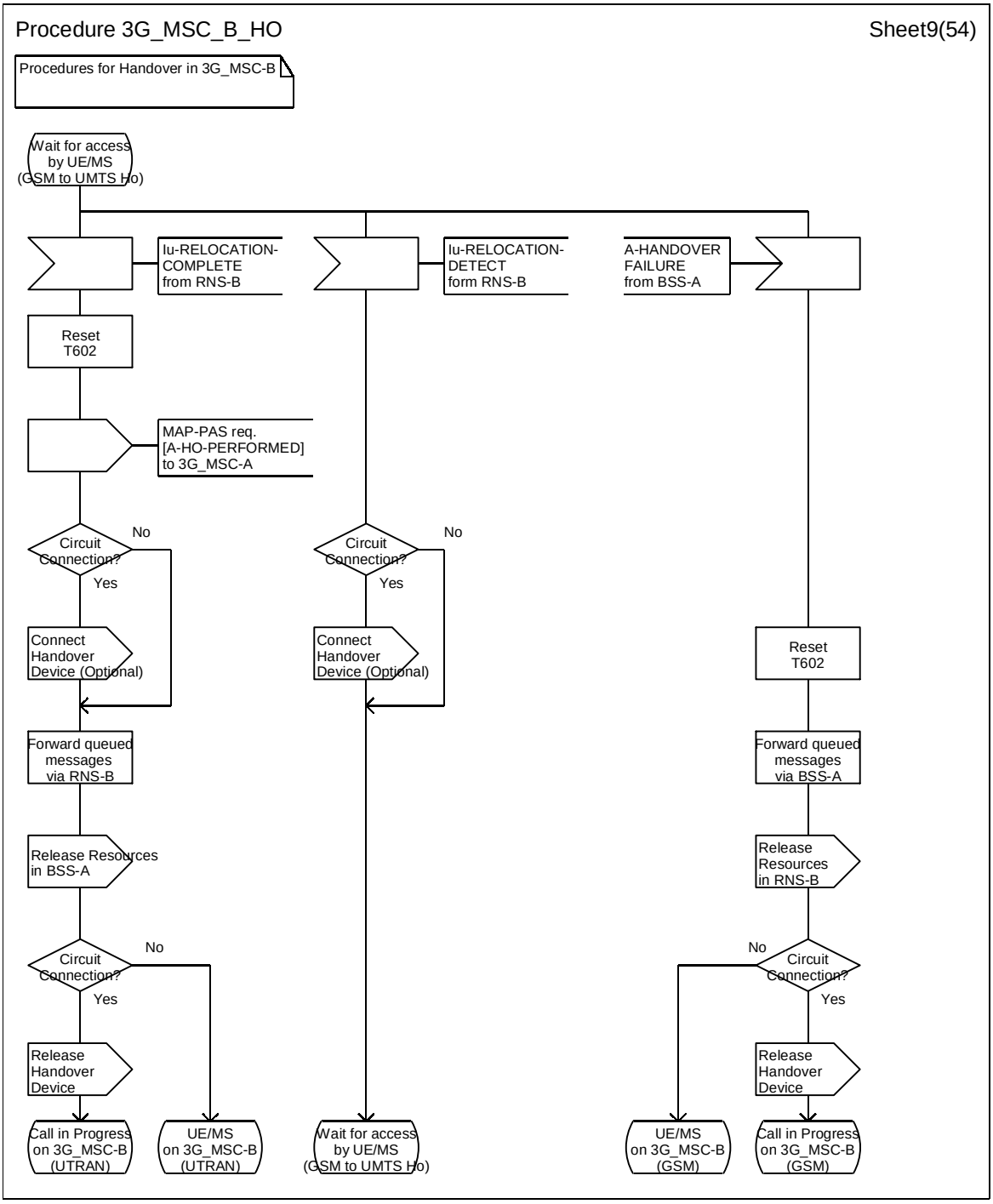

Procedures for Handover in 3G_MSC-B
Basic GSM to UMTS handover from MSC-A to 3G_MSC-B
Circuit Connection required
Wait for Connection from MSC-A (GSM to UMTS Ho)
I_CONNECT (IAM) from MSC-A (Uses Handover No.)
Expiry T610
Iu-RELEASE-REQUEST from RNS-B
Reset T610
To MSC-A in 3G_MSC-B
Cancel MAP Procedures
Cancel MAP Procedures
e.g. MAP-ABORT from MSC-A
MAP-PAS req. [A-CLEAR-REQUEST] to MSC-A
MAP-SEND-HANDOVER-REPORT resp. to VLR-B
Cancel MAP Procedures
To MSC-A in 3G_MSC-B
Set T604
I_COMPLETE (ACM) to MSC-A
Release Radio Resources on RNS-B
Wait for access by UE/MS on RNS-B (GSM to UMTS Ho)
IDLE

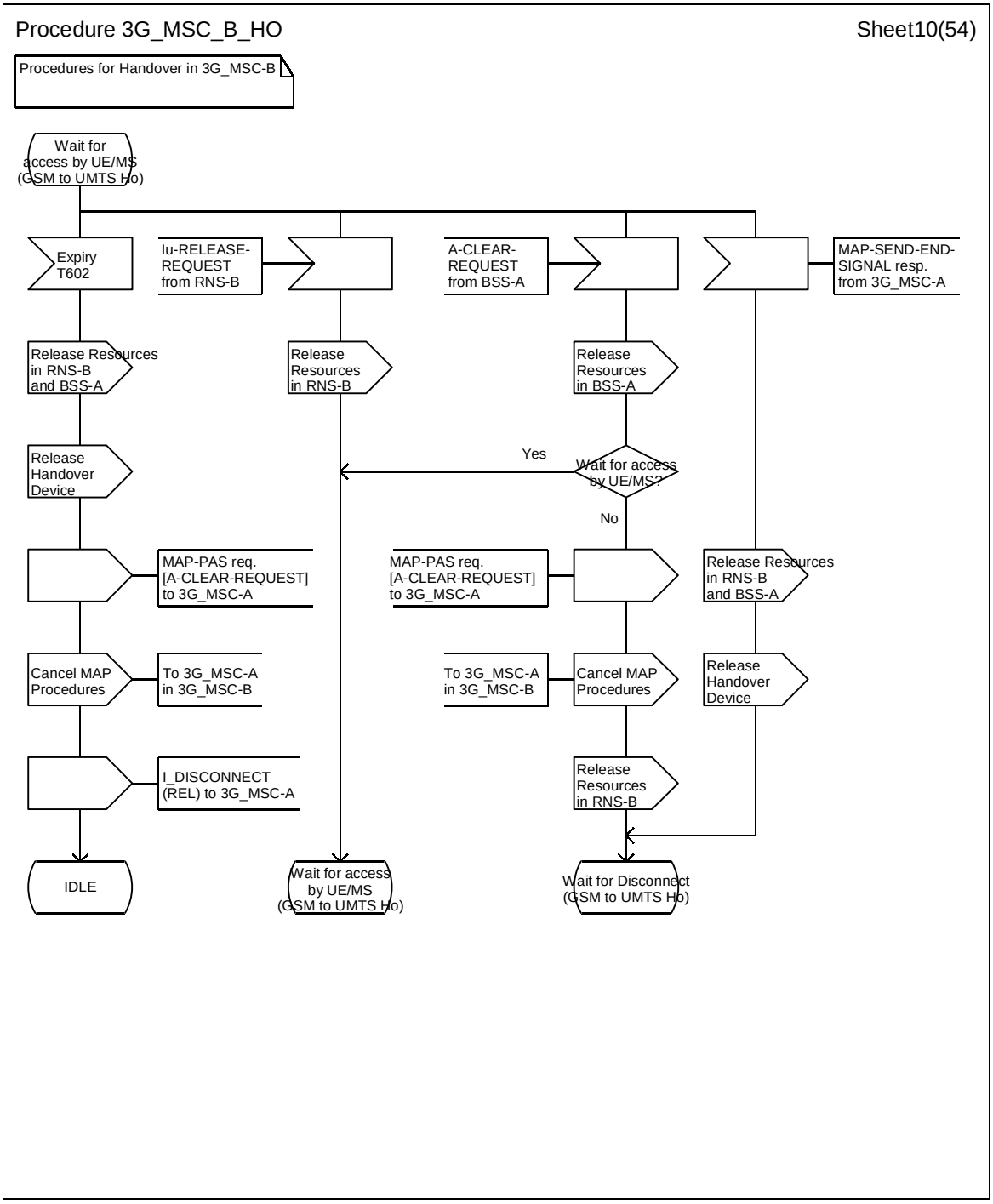

Procedures for Handover in 3G_MSC-B
Wait for access by UE/MS on RNS-B (GSM to UMTS Ho)
Iu-RELOCATION-COMPLETE from RNS-B
Iu-RELEASE-REQUEST from RNS-B
Expiry T604
from MSC-A
Cancel MAP Procedure
MAP-PAS req [A-CLEAR-REQUEST] to MSC-A
Reset T604
Reset T604
I_DISCONNECT (REL) to MSC-A
ANM Sent?
Yes
No
I_DISCONNECT (REL) from MSC-A
Release Resources on RNS-B
I_ANSWER (ANM) to MSC-A
Iu-RELOCATION-DETECT from RNS-B
to MSC-A in 3G_MSC-B
Cancel MAP Procedures
I_ANSWER (ANM) to MSC-A
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] to MSC-A
Release Resources on RNS-B
MAP-PAS req [A-HO-DETECT] to MSC-A
Call in Progress on 3G_MSC-B (UTRAN)
IDLE
Wait for access by UE/MS on RNS-B (GSM to UMTS Ho)
Wait for Disconnect (GSM to UMTS Ho)

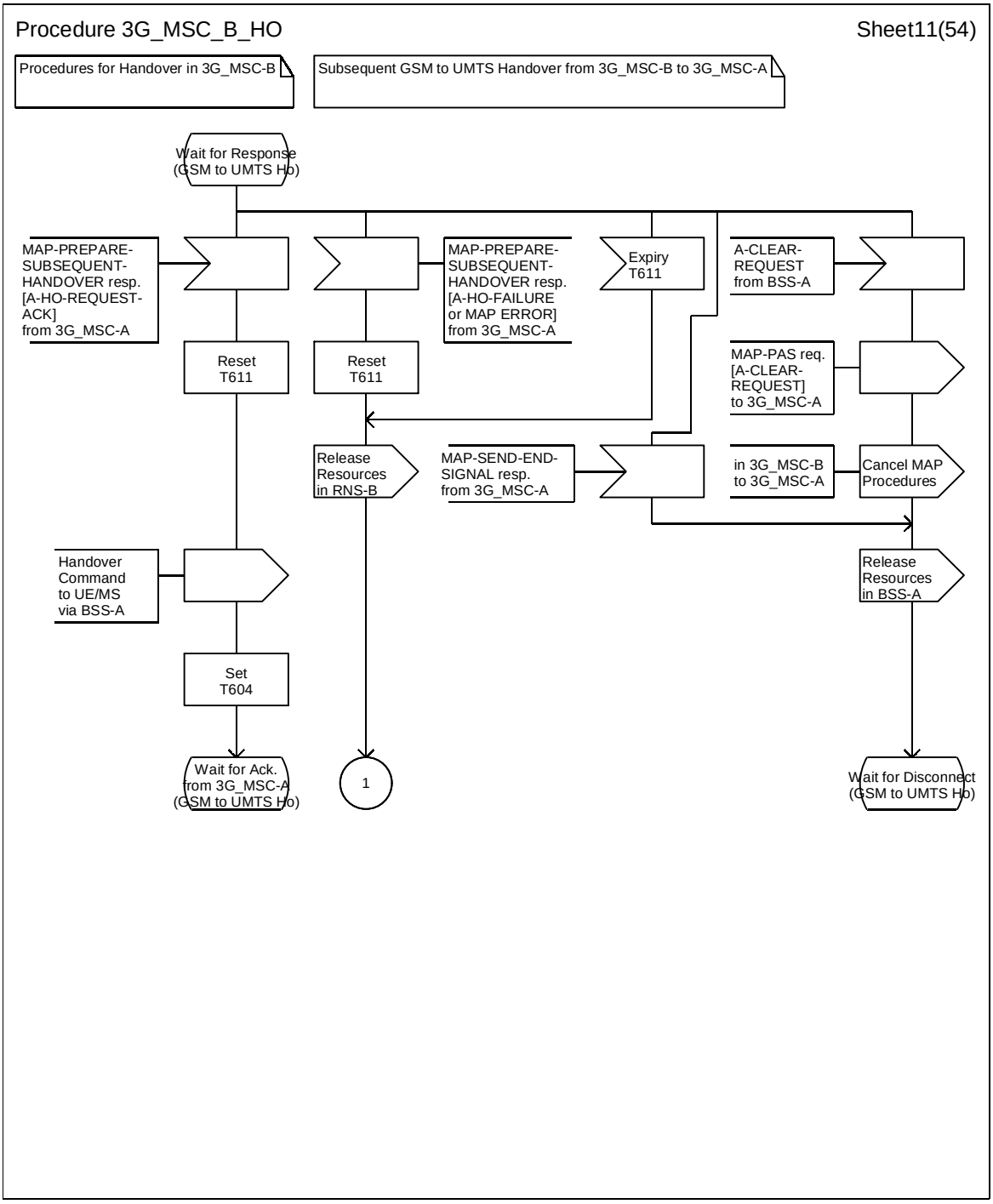

Procedures for Handover in 3G_MSC-B
Call in Progress on 3G_MSC-B (GSM)
Forward Messages to UE/MS
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
A-CLEAR-REQUEST from BSS-A
A-HO-PERFORMED from BSS-A
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
MAP-PAS req. [A-HO-PERFORMED] to 3G_MSC-A
Cancel MAP Procedures
Call in Progress on 3G_MSC-B (GSM)
Release Resources in BSS-A
I_DISCONNECT (REL) from 3G_MSC-A
Cancel MAP Procedures
from 3G_MSC-A
3G_MSC-A disconnected?
Yes
No
Release Resources in BSS-A
A-HANDOVER-REQUIRED from BSS-A
Wait for Disconnect (UMTS to GSM Ho)
I_DISCONNECT (REL) to 3G_MSC-A
I_DISCONNECT (REL) from 3G_MSC-A
IDLE
Call in Progress on 3G_MSC-B (GSM)
IDLE
2

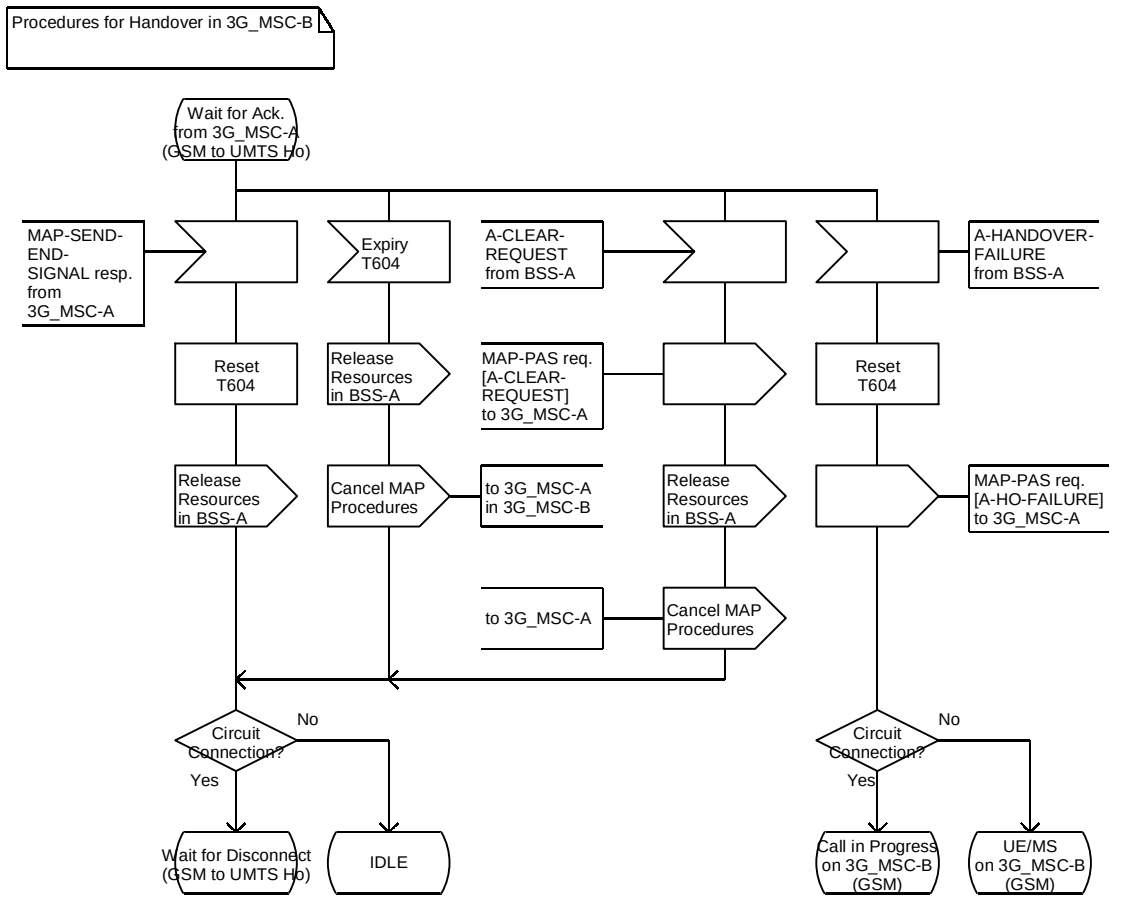

Procedures for Handover in 3G_MSC-B
2
Known 3G_MSC?
Yes
No
No
Handover allowed to Cell?
Yes
Which 3G_MSC?
3G_MSC-A/3G_MSC-B'
3G_MSC-B
Known RNS?
No
Yes
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [A-HO-REQUEST] to 3G_MSC-A
1
Resources on RNS-B?
No
Yes
No
Send Reject?
Yes
A-HANDOVER-REJECT to BSS-A
Set T611
Circuit Connection?
No
Yes
Call in Progress on 3G_MSC-B (GSM)
UE/MS on 3G_MSC-B (GSM)
3
Wait for Response (GSM to UMTS Ho)


Procedures for Handover in 3G_MSC-B
Handover from BSS-A to RNS-B on 3G_MSC-B
3
Iu-RELOCATION-REQUEST to RNS-B
Set T601
Wait for Channel (GSM to UMTS Ho)
Iu-RELOCATION-REQUEST-ACK from RNS-B
Expiry T601
Iu-RELOCATION-FAILURE from RNS-B
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Reset T601
Reset T601
A-CLEAR-REQUEST from BSS-A
Queue Messages in 3G_MSC-B
MAP-PAS req [A-CLEAR-REQUEST] to 3G_MSC-A
Cancel Channel request on RNS-B
Handover Command to UE/MS via BSS-A
Release Resources on RNS-B
Cancel MAP Procedures
To 3G_MSC-A in 3G_MSC-B
Set Up Handover Device
Release Resources on BSS-A
Set T602
Wait for access by UE/MS (GSM to UMTS Ho)
1
Wait for Disconnect (GSM to UMTS Ho)

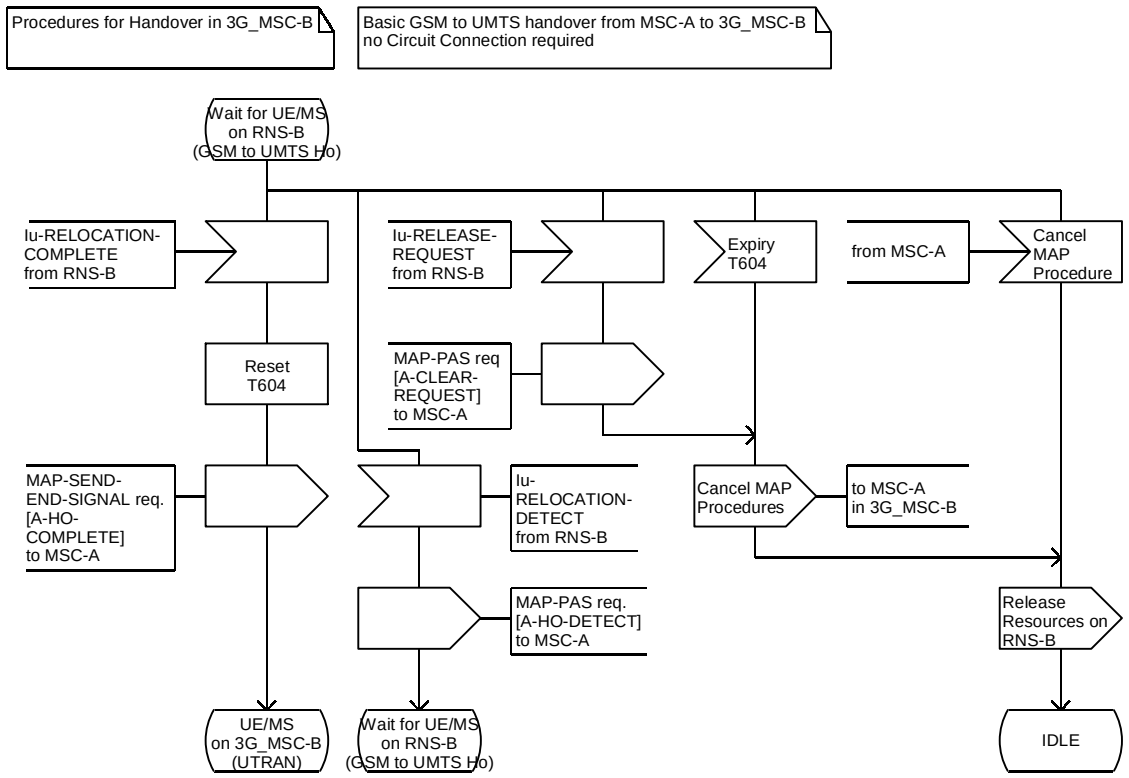

Procedures for Handover in 3G_MSC-B
Wait for access by UE/MS (GSM to UMTS Ho)
Iu-RELOCATION-COMPLETE from RNS-B
Iu-RELOCATION-DETECT form RNS-B
A-HANDOVER FAILURE from BSS-A
Reset T602
MAP-PAS req. [A-HO-PERFORMED] to 3G_MSC-A
Circuit Connection?
No
Yes
Connect Handover Device (Optional)
Forward queued messages via RNS-B
Release Resources in BSS-A
Release Handover Device
Call in Progress on 3G_MSC-B (UTRAN)
UE/MS on 3G_MSC-B (UTRAN)
Wait for access by UE/MS (GSM to UMTS Ho)
Reset T602
Forward queued messages via BSS-A
Release Resources in RNS-B
UE/MS on 3G_MSC-B (GSM)
Call in Progress on 3G_MSC-B (GSM)

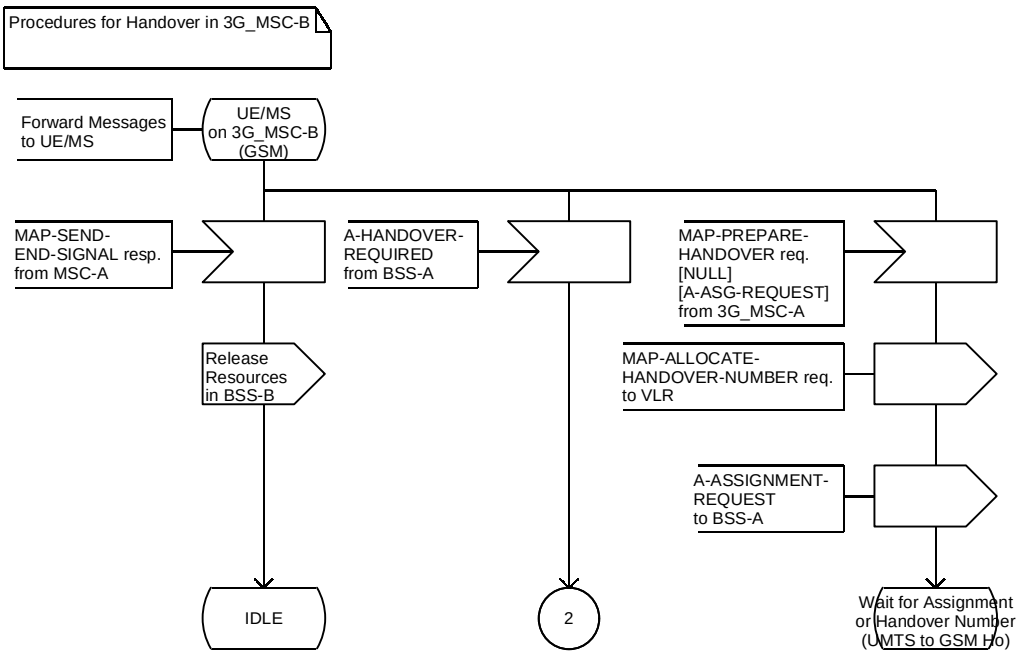

Procedures for Handover in 3G_MSC-B
Wait for access by UE/MS (GSM to UMTS Ho)
Expiry T602
Iu-RELEASE-REQUEST from RNS-B
A-CLEAR-REQUEST from BSS-A
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Release Resources in RNS-B and BSS-A
Release Resources in RNS-B
Release Resources in BSS-A
Release Handover Device
Yes
Wait for access by UE/MS?
No
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
Release Resources in RNS-B and BSS-A
Cancel MAP Procedures
To 3G_MSC-A in 3G_MSC-B
To 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-A
Release Resources in RNS-B
IDLE
Wait for access by UE/MS (GSM to UMTS Ho)
Wait for Disconnect (GSM to UMTS Ho)

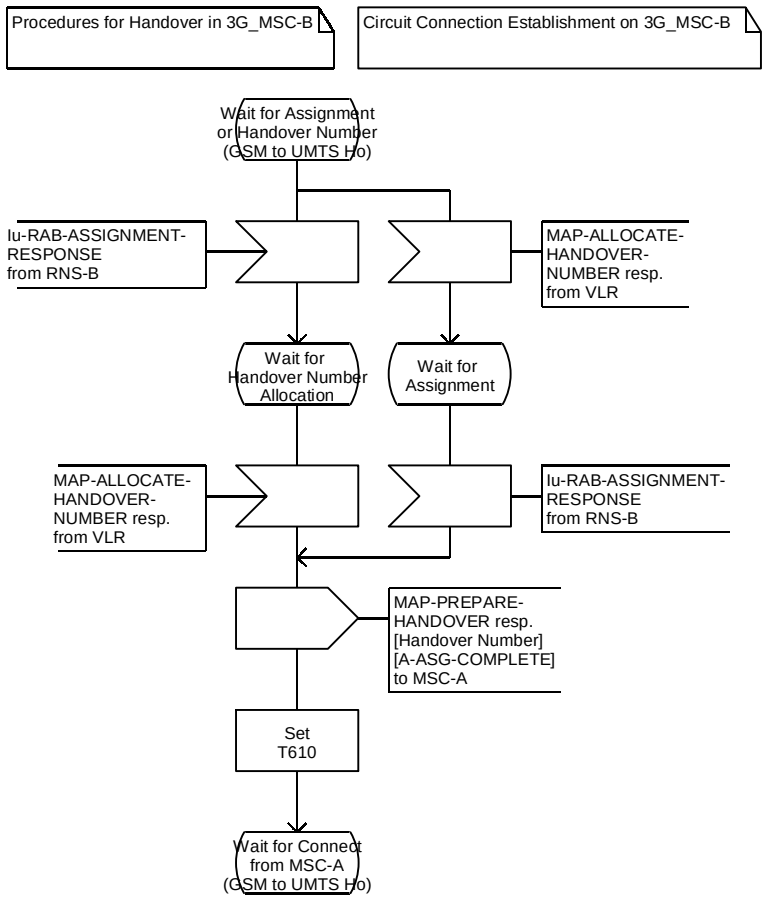

Procedures for Handover in 3G_MSC-B
Subsequent GSM to UMTS Handover from 3G_MSC-B to 3G_MSC-A
Wait for Response (GSM to UMTS Ho)
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-REQUEST-ACK] from 3G_MSC-A
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE or MAP ERROR] from 3G_MSC-A
Expiry T611
A-CLEAR-REQUEST from BSS-A
Reset T611
Reset T611
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
Release Resources in RNS-B
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
in 3G_MSC-B to 3G_MSC-A
Cancel MAP Procedures
Handover Command to UE/MS via BSS-A
Release Resources in BSS-A
Set T604
Wait for Ack. from 3G_MSC-A (GSM to UMTS Ho)
1
Wait for Disconnect (GSM to UMTS Ho)

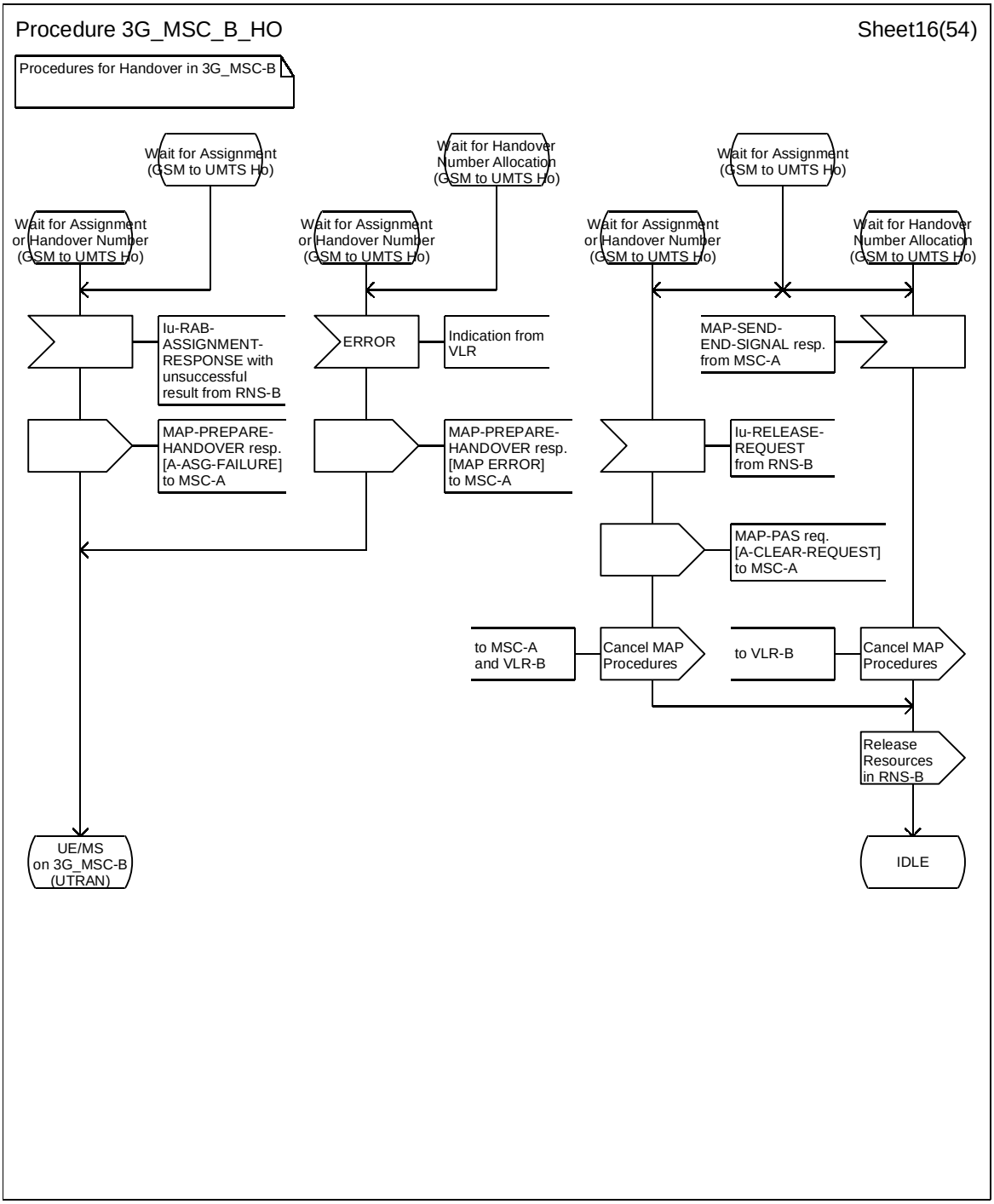

Procedures for Handover in 3G_MSC-B
Wait for Ack. from 3G_MSC-A (GSM to UMTS Ho)
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Expiry T604
A-CLEAR-REQUEST from BSS-A
A-HANDOVER-FAILURE from BSS-A
Reset T604
Release Resources in BSS-A
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
Reset T604
Release Resources in BSS-A
Cancel MAP Procedures
to 3G_MSC-A in 3G_MSC-B
Release Resources in BSS-A
MAP-PAS req. [A-HO-FAILURE] to 3G_MSC-A
to 3G_MSC-A
Cancel MAP Procedures
Circuit Connection?
No
Yes
Circuit Connection?
No
Yes
Wait for Disconnect (GSM to UMTS Ho)
IDLE
Call in Progress on 3G_MSC-B (GSM)
UE/MS on 3G_MSC-B (GSM)

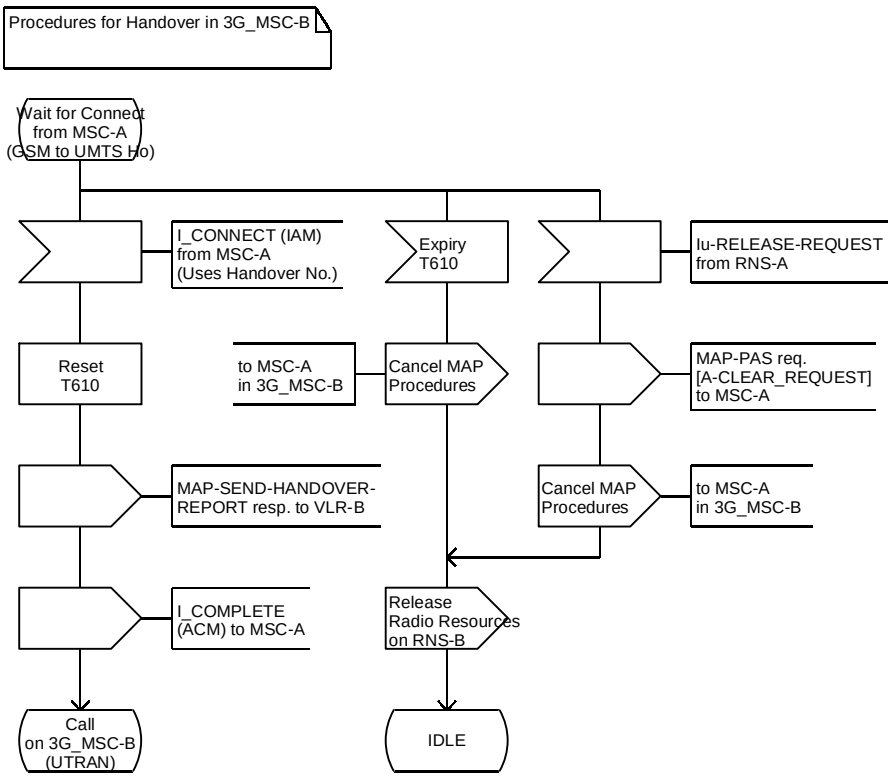
Procedure 3G_MSC_B_HO



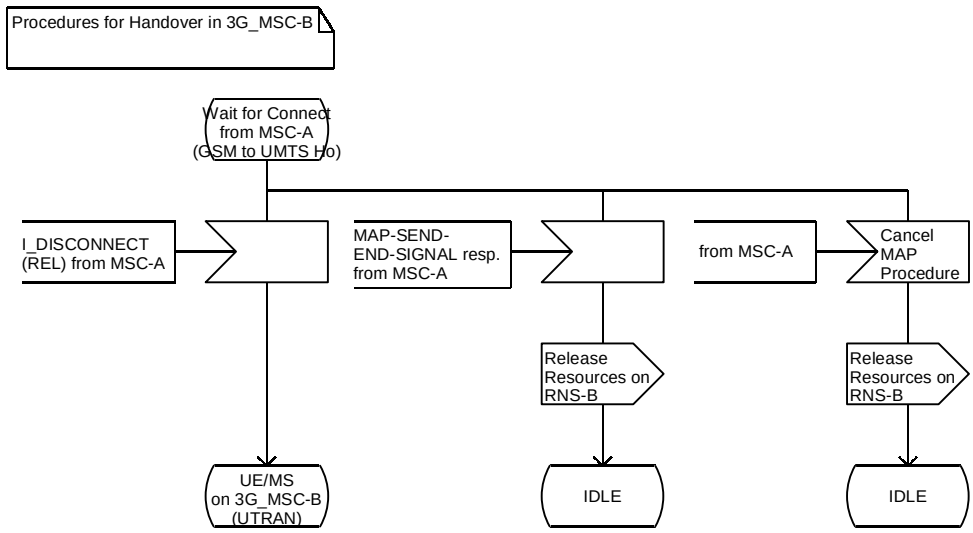

Procedures for Handover in 3G_MSC-B
Forward Messages to UE/MS
UE/MS on 3G_MSC-B (GSM)
MAP-SEND-END-SIGNAL resp. from MSC-A
A-HANDOVER-REQUIRED from BSS-A
MAP-PREPARE-HANDOVER req. [NULL] [A-ASG-REQUEST] from 3G_MSC-A
Release Resources in BSS-B
MAP-ALLOCATE-HANDOVER-NUMBER req. to VLR
A-ASSIGNMENT-REQUEST to BSS-A
IDLE
2
Wait for Assignment or Handover Number (UMTS to GSM Ho)


Procedures for Handover in 3G_MSC-B
Circuit Connection Establishment on 3G_MSC-B
Wait for Assignment or Handover Number (GSM to UMTS Ho)
Iu-RAB-ASSIGNMENT-RESPONSE from RNS-B
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Wait for Handover Number Allocation
Wait for Assignment
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Iu-RAB-ASSIGNMENT-RESPONSE from RNS-B
MAP-PREPARE-HANDOVER resp. [Handover Number] [A-ASG-COMPLETE] to MSC-A
Set T610
Wait for Connect from MSC-A (GSM to UMTS Ho)

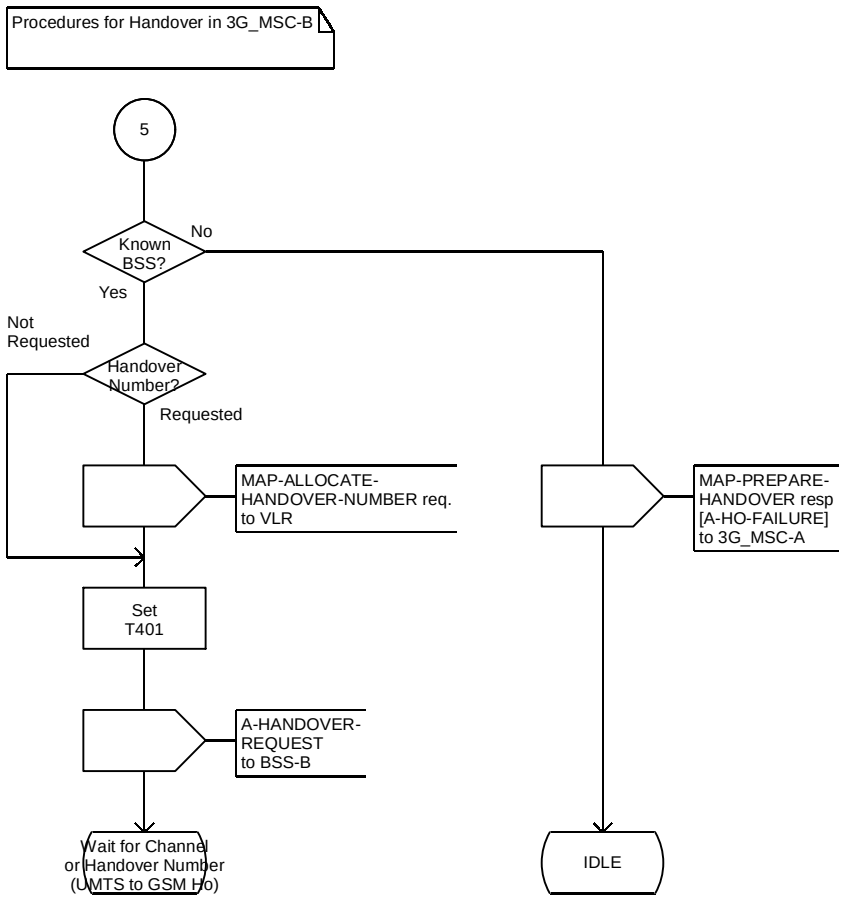

Procedures for Handover in 3G_MSC-B
Wait for Assignment (GSM to UMTS Ho)
Wait for Handover Number Allocation (GSM to UMTS Ho)
Wait for Assignment (GSM to UMTS Ho)
Wait for Assignment or Handover Number (GSM to UMTS Ho)
Wait for Assignment or Handover Number (GSM to UMTS Ho)
Wait for Assignment or Handover Number (GSM to UMTS Ho)
Wait for Handover Number Allocation (GSM to UMTS Ho)
Iu-RAB-ASSIGNMENT-RESPONSE with unsuccessful result from RNS-B
ERROR
Indication from VLR
MAP-SEND-END-SIGNAL resp. from MSC-A
MAP-PREPARE-HANDOVER resp. [A-ASG-FAILURE] to MSC-A
MAP-PREPARE-HANDOVER resp. [MAP ERROR] to MSC-A
Iu-RELEASE-REQUEST from RNS-B
MAP-PAS req. [A-CLEAR-REQUEST] to MSC-A
to MSC-A and VLR-B
Cancel MAP Procedures
to VLR-B
Cancel MAP Procedures
Release Resources in RNS-B
UE/MS on 3G_MSC-B (UTRAN)
IDLE

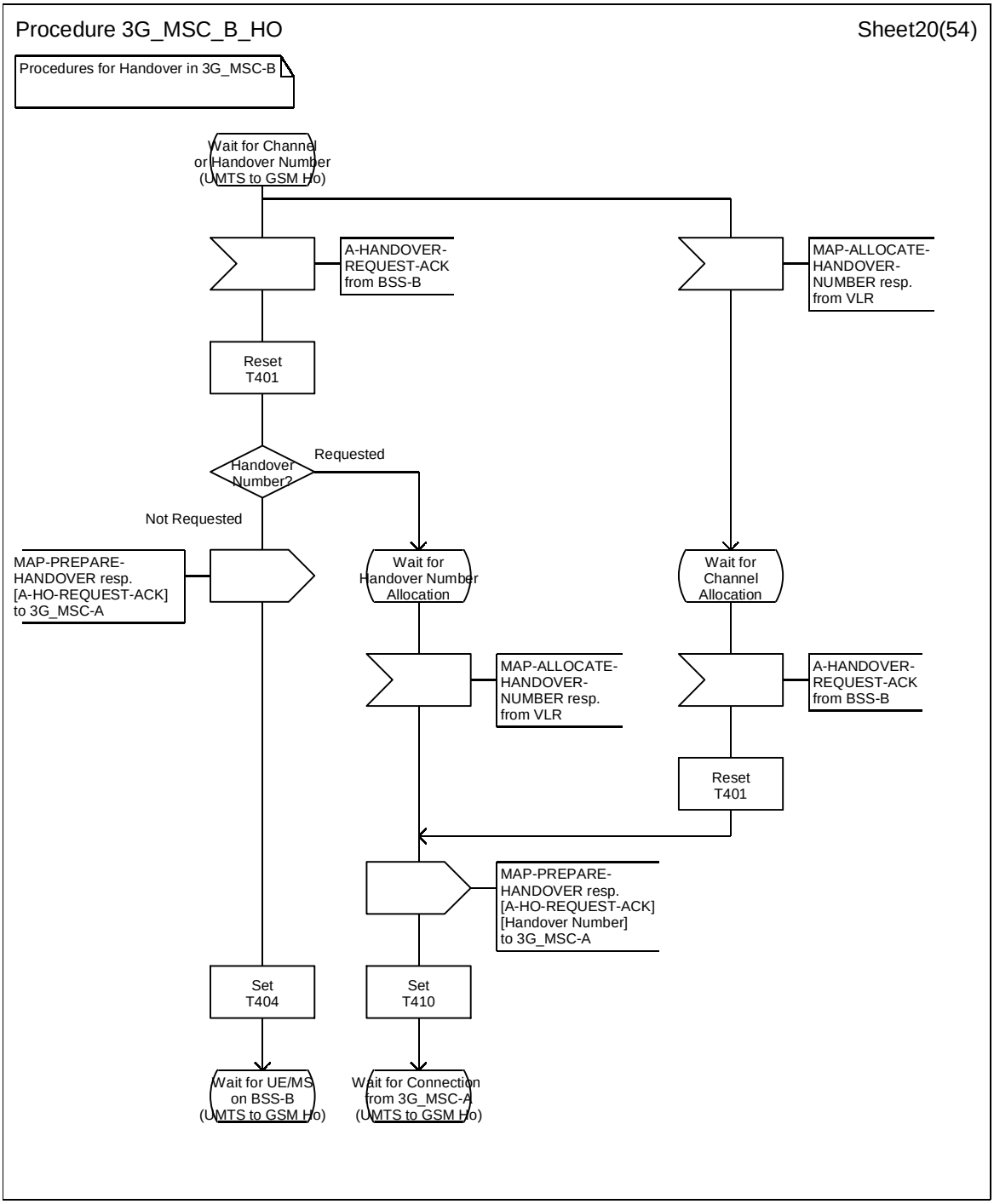

Procedures for Handover in 3G_MSC-B
Wait for Connect from MSC-A (GSM to UMTS Ho)
I_CONNECT (IAM) from MSC-A (Uses Handover No.)
Expiry T610
Iu-RELEASE-REQUEST from RNS-A
Reset T610
to MSC-A in 3G_MSC-B
Cancel MAP Procedures
MAP-PAS req. [A-CLEAR_REQUEST] to MSC-A
MAP-SEND-HANDOVER-REPORT resp. to VLR-B
Cancel MAP Procedures
to MSC-A in 3G_MSC-B
I_COMPLETE (ACM) to MSC-A
Release Radio Resources on RNS-B
Call on 3G_MSC-B (UTRAN)
IDLE

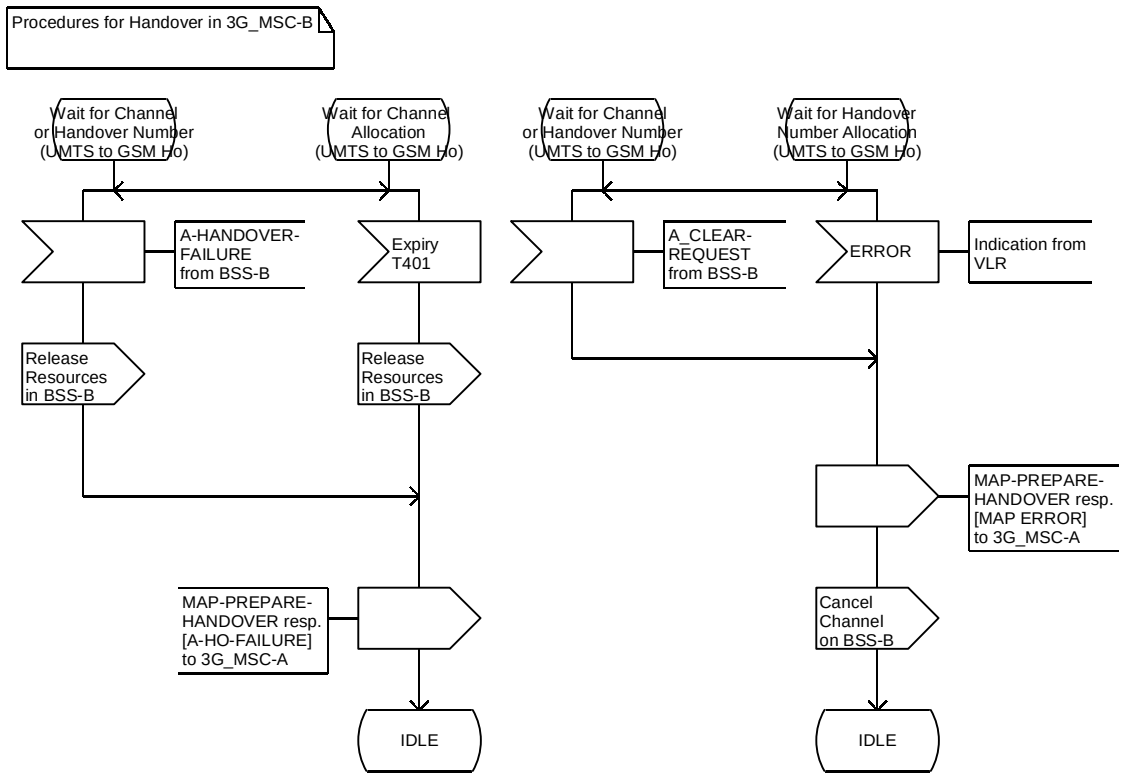
Procedure 3G_MSC_B_HO

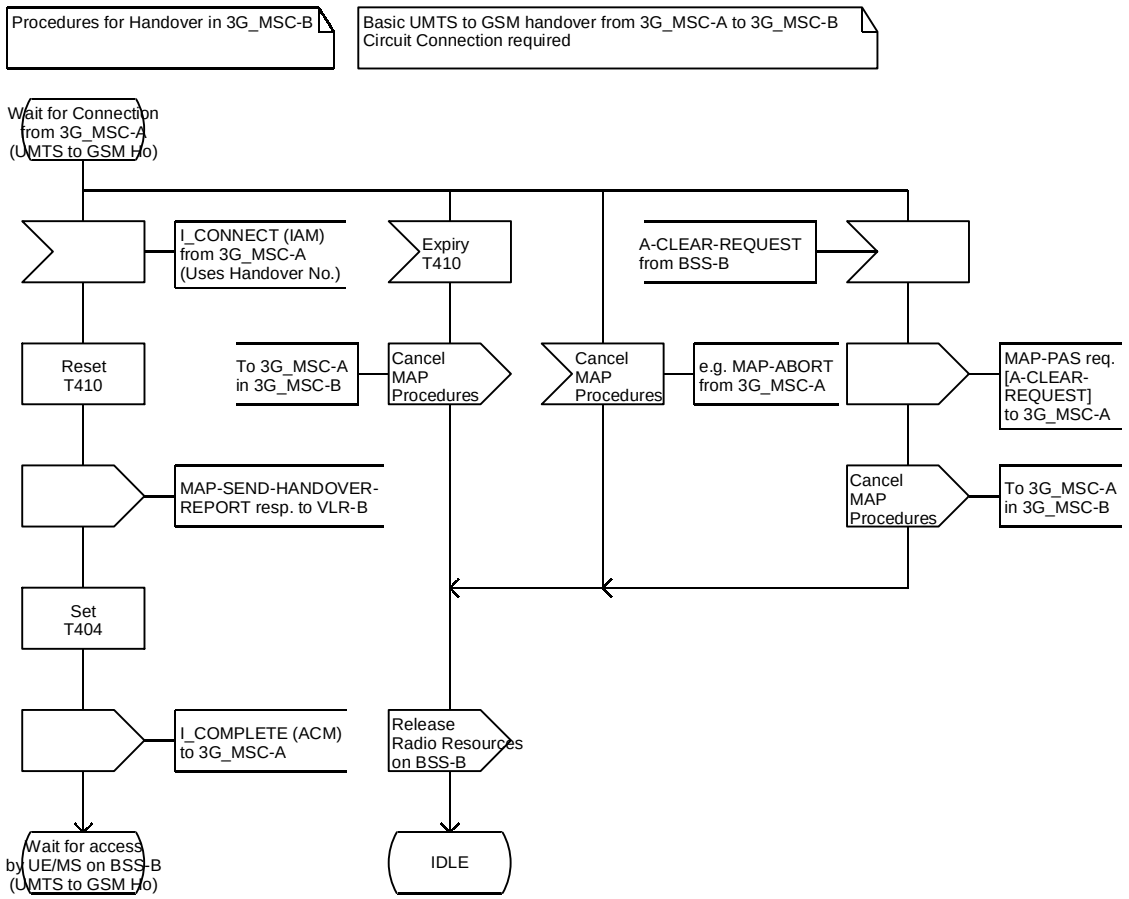


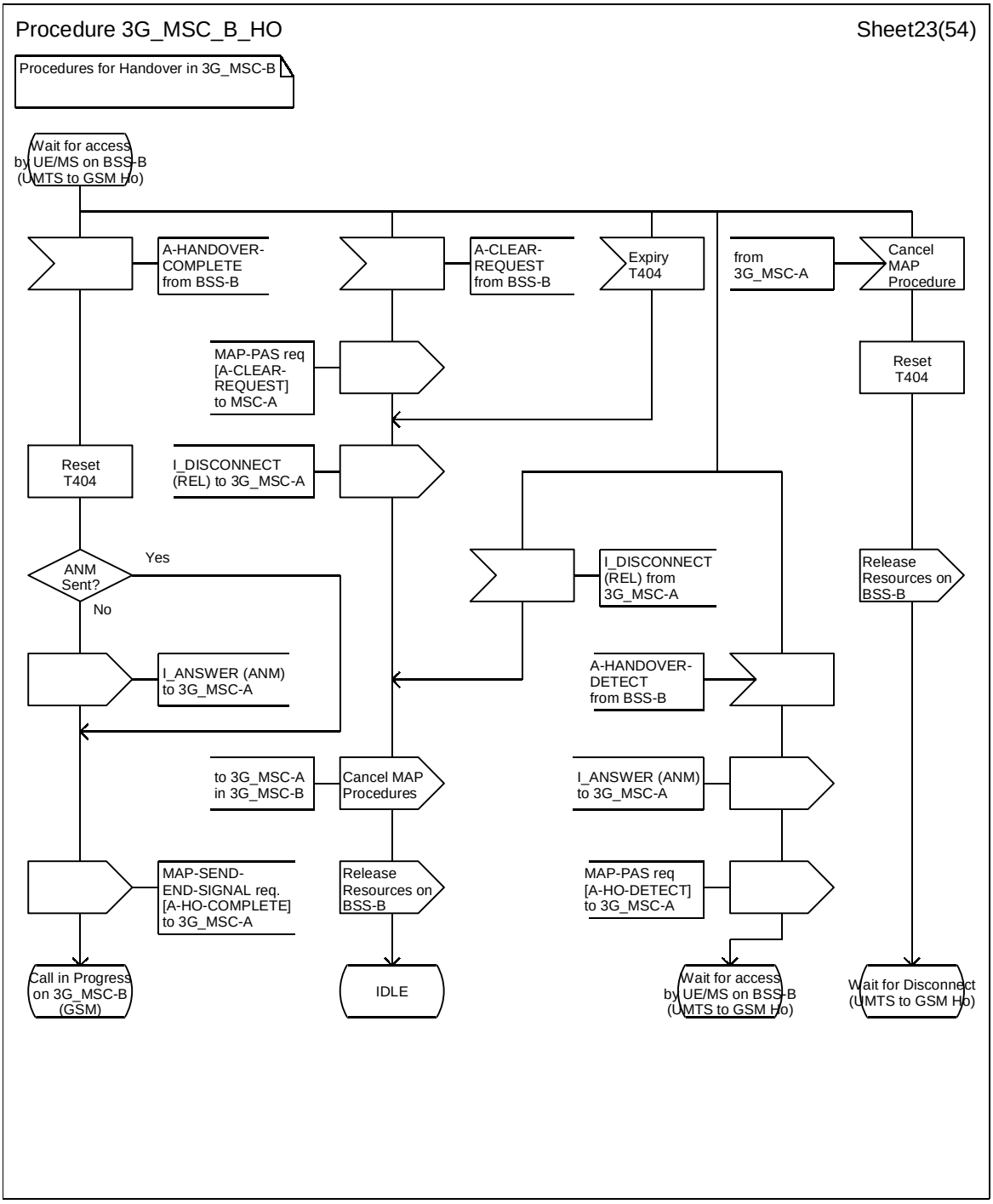
Procedure 3G_MSC_B_HO

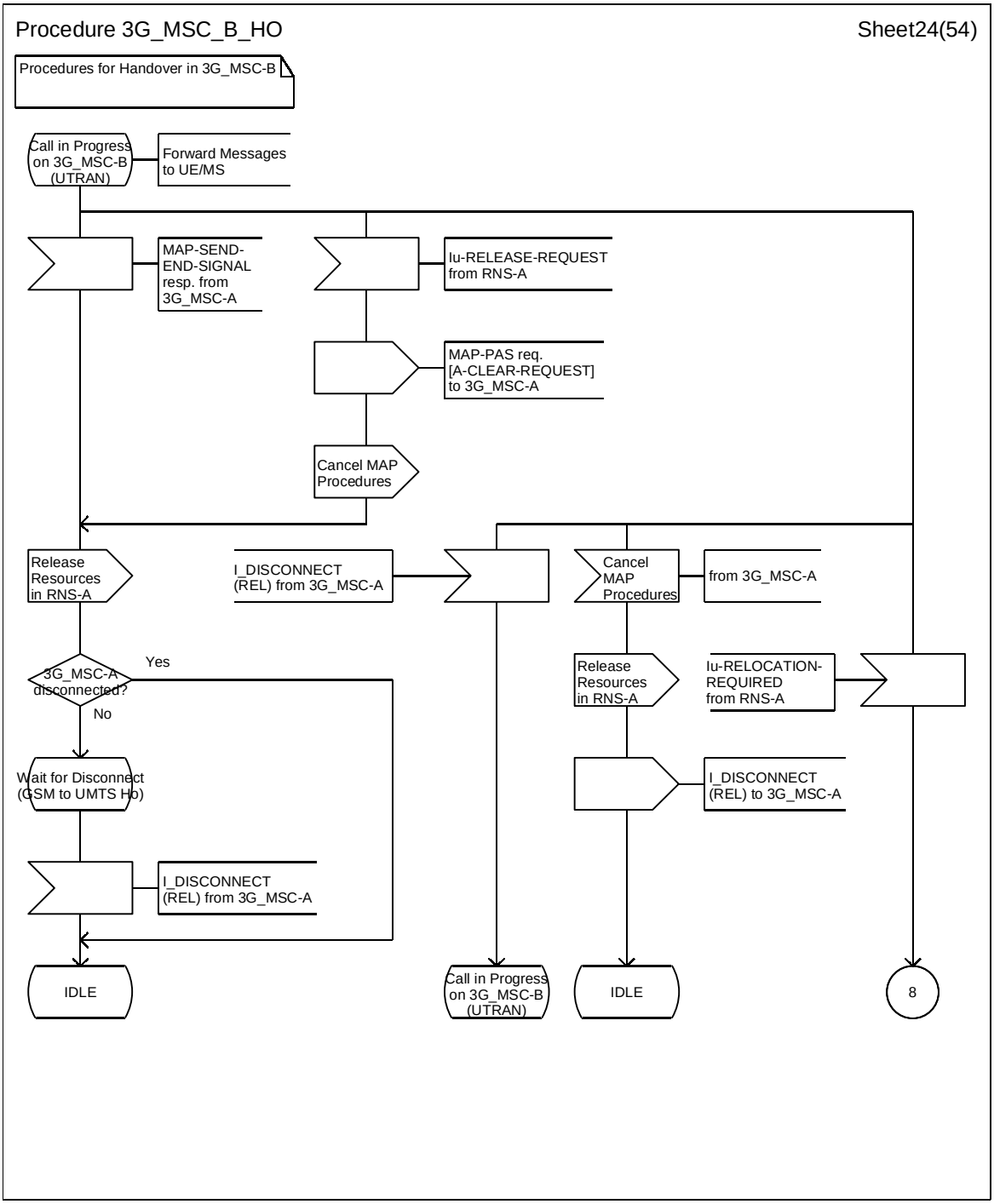


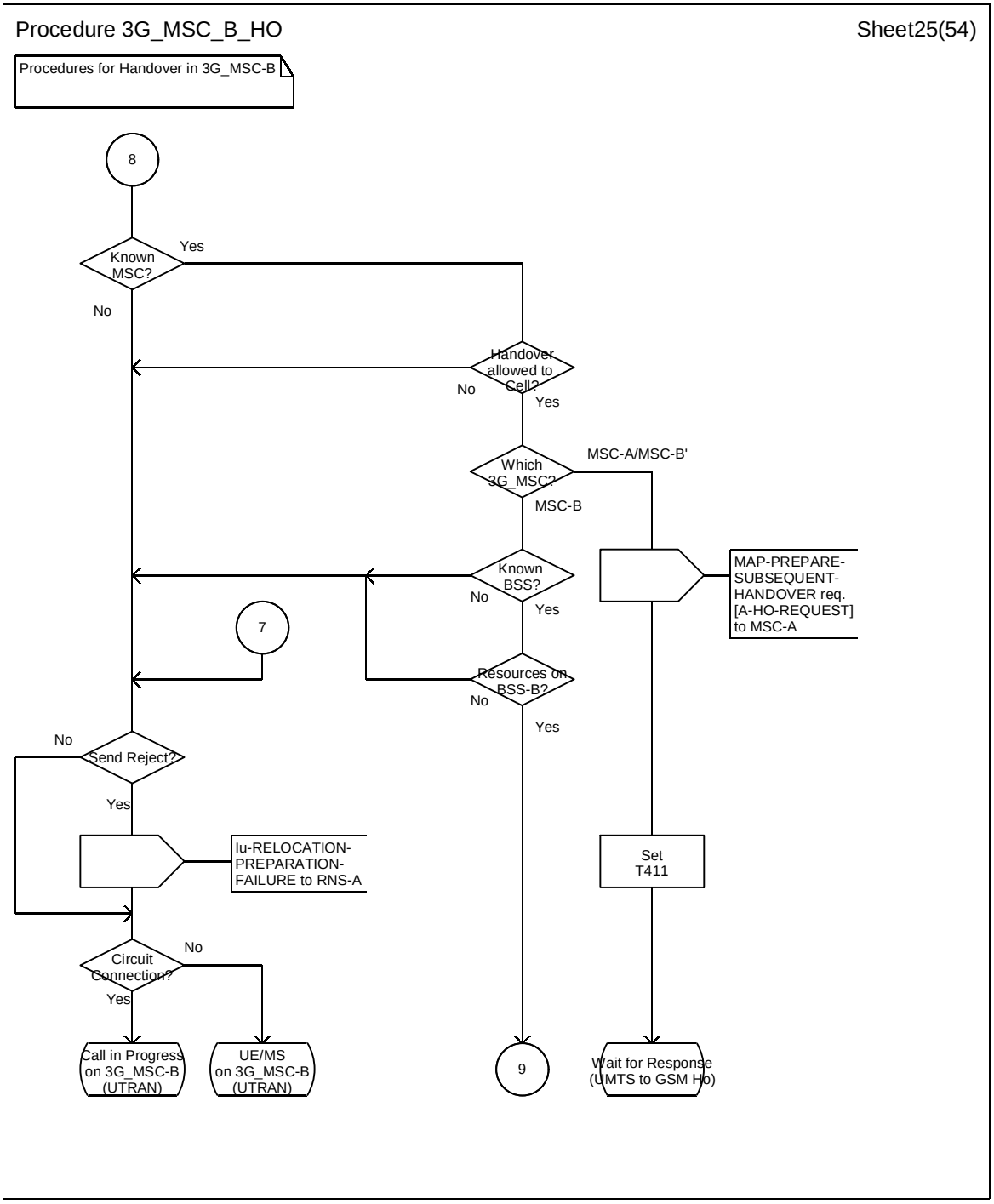

Procedures for Handover in 3G_MSC-B
Wait for Channel or Handover Number (UMTS to GSM Ho)
A-HANDOVER-REQUEST-ACK from BSS-B
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Reset T401
Handover Number?
Requested
Not Requested
MAP-PREPARE-HANDOVER resp. [A-HO-REQUEST-ACK] to 3G_MSC-A
Wait for Handover Number Allocation
Wait for Channel Allocation
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
A-HANDOVER-REQUEST-ACK from BSS-B
Reset T401
MAP-PREPARE-HANDOVER resp. [A-HO-REQUEST-ACK] [Handover Number] to 3G_MSC-A
Set T404
Set T410
Wait for UE/MS on BSS-B (UMTS to GSM Ho)
Wait for Connection from 3G_MSC-A (UMTS to GSM Ho)


Procedures for Handover in 3G_MSC-B
Wait for Channel or Handover Number (UMTS to GSM Ho)
Wait for Channel Allocation (UMTS to GSM Ho)
Wait for Channel or Handover Number (UMTS to GSM Ho)
Wait for Handover Number Allocation (UMTS to GSM Ho)
A-HANDOVER-FAILURE from BSS-B
Expiry T401
A_CLEAR-REQUEST from BSS-B
ERROR
Indication from VLR
Release Resources in BSS-B
Release Resources in BSS-B
MAP-PREPARE-HANDOVER resp. [MAP ERROR] to 3G_MSC-A
MAP-PREPARE-HANDOVER resp. [A-HO-FAILURE] to 3G_MSC-A
Cancel Channel on BSS-B
IDLE
IDLE


Procedures for Handover in 3G_MSC-B
Basic UMTS to GSM handover from 3G_MSC-A to 3G_MSC-B
Circuit Connection required
Wait for Connection from 3G_MSC-A (UMTS to GSM Ho)
I_CONNECT (IAM) from 3G_MSC-A (Uses Handover No.)
Expiry T410
A-CLEAR-REQUEST from BSS-B
Reset T410
To 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
Cancel MAP Procedures
e.g. MAP-ABORT from 3G_MSC-A
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
MAP-SEND-HANDOVER-REPORT resp. to VLR-B
Cancel MAP Procedures
To 3G_MSC-A in 3G_MSC-B
Set T404
I_COMPLETE (ACM) to 3G_MSC-A
Release Radio Resources on BSS-B
Wait for access by UE/MS on BSS-B (UMTS to GSM Ho)
IDLE

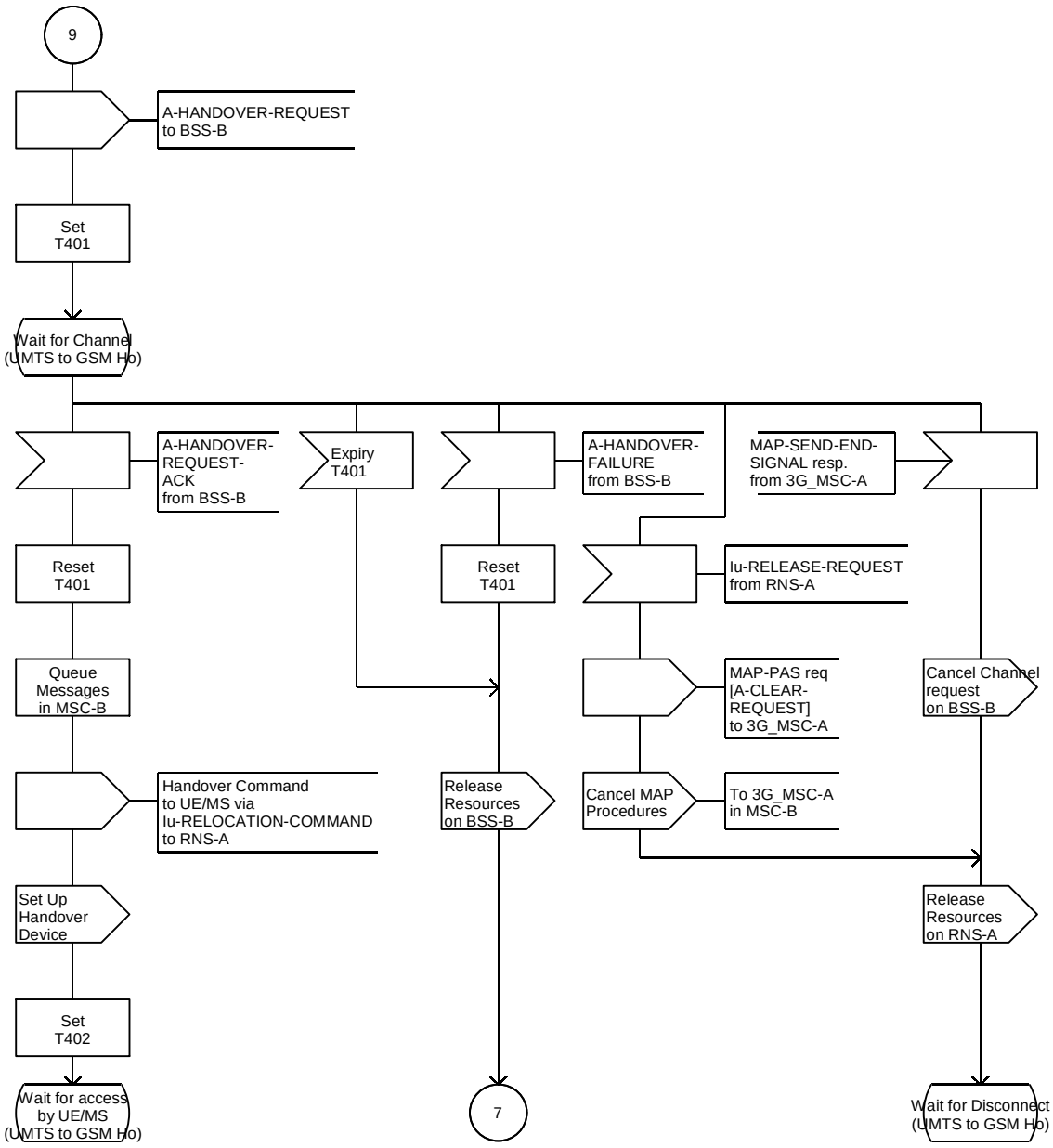

Procedures for Handover in 3G_MSC-B
Wait for access by UE/MS on BSS-B (UMTS to GSM Ho)
A-HANDOVER-COMPLETE from BSS-B
A-CLEAR-REQUEST from BSS-B
Expiry T404
from 3G_MSC-A
Cancel MAP Procedure
MAP-PAS req [A-CLEAR-REQUEST] to MSC-A
Reset T404
Reset T404
I_DISCONNECT (REL) to 3G_MSC-A
ANM Sent?
Yes
No
I_DISCONNECT (REL) from 3G_MSC-A
Release Resources on BSS-B
I_ANSWER (ANM) to 3G_MSC-A
A-HANDOVER-DETECT from BSS-B
to 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
I_ANSWER (ANM) to 3G_MSC-A
MAP-SEND-END-SIGNAL req. [A-HO-COMPLETE] to 3G_MSC-A
Release Resources on BSS-B
MAP-PAS req [A-HO-DETECT] to 3G_MSC-A
Call in Progress on 3G_MSC-B (GSM)
IDLE
Wait for access by UE/MS on BSS-B (UMTS to GSM Ho)
Wait for Disconnect (UMTS to GSM Ho)

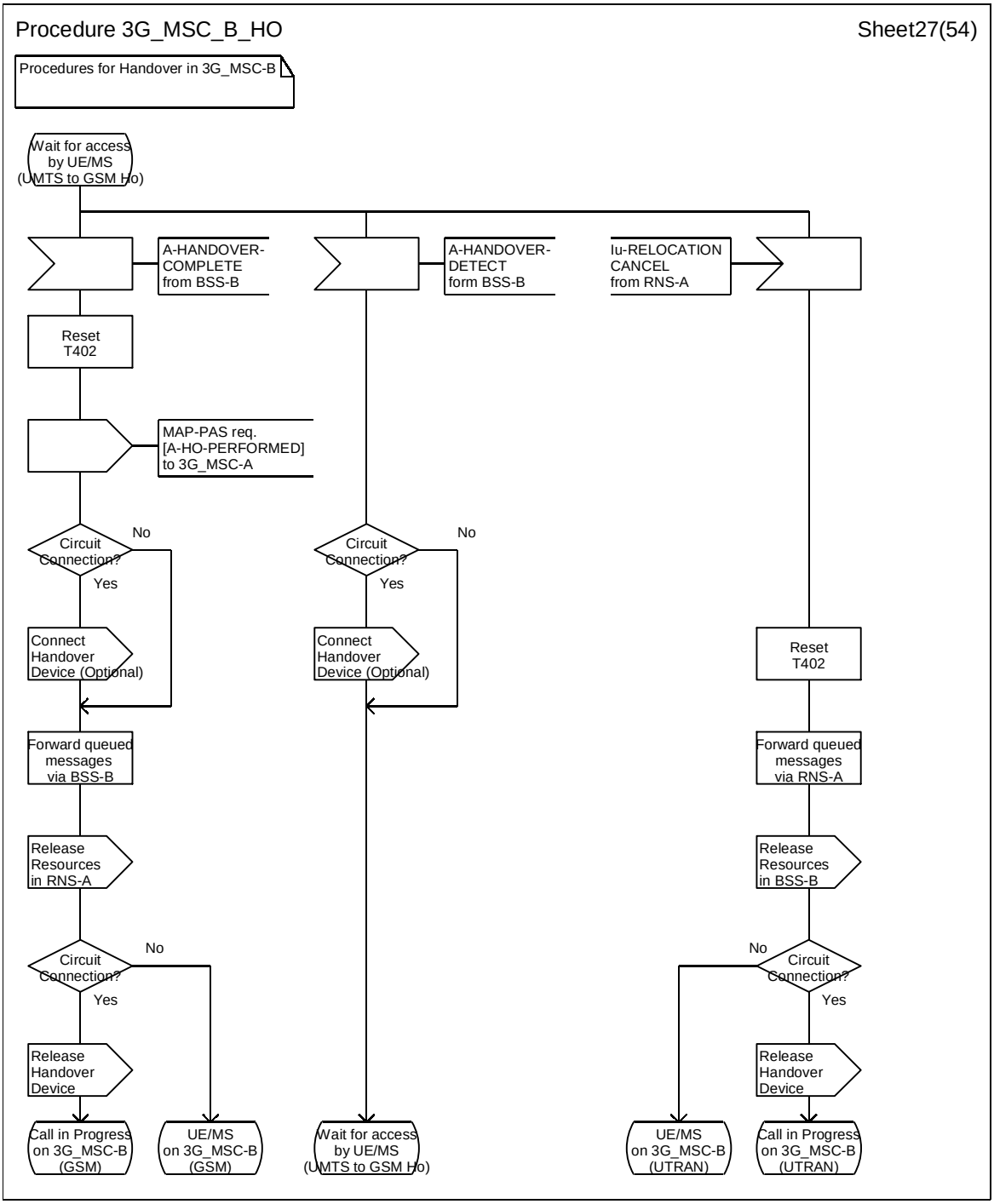

Procedures for Handover in 3G_MSC-B
Call in Progress on 3G_MSC-B (UTRAN)
Forward Messages to UE/MS
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Iu-RELEASE-REQUEST from RNS-A
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
Cancel MAP Procedures
Release Resources in RNS-A
I_DISCONNECT (REL) from 3G_MSC-A
Cancel MAP Procedures
from 3G_MSC-A
3G_MSC-A disconnected?
Yes
No
Release Resources in RNS-A
Iu-RELOCATION-REQUIRED from RNS-A
Wait for Disconnect (GSM to UMTS Ho)
I_DISCONNECT (REL) to 3G_MSC-A
I_DISCONNECT (REL) from 3G_MSC-A
IDLE
Call in Progress on 3G_MSC-B (UTRAN)
IDLE
8


Procedures for Handover in 3G_MSC-B
8
Known MSC?
Yes
No
Handover allowed to Cell?
No
Yes
Which 3G_MSC?
MSC-A/MSC-B'
MSC-B
Known BSS?
No
Yes
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [A-HO-REQUEST] to MSC-A
7
Resources on BSS-B?
No
Yes
No
Send Reject?
Yes
Iu-RELOCATION-PREPARATION-FAILURE to RNS-A
Set T411
Circuit Connection?
No
Yes
Call in Progress on 3G_MSC-B (UTRAN)
UE/MS on 3G_MSC-B (UTRAN)
9
Wait for Response (UMTS to GSM Ho)

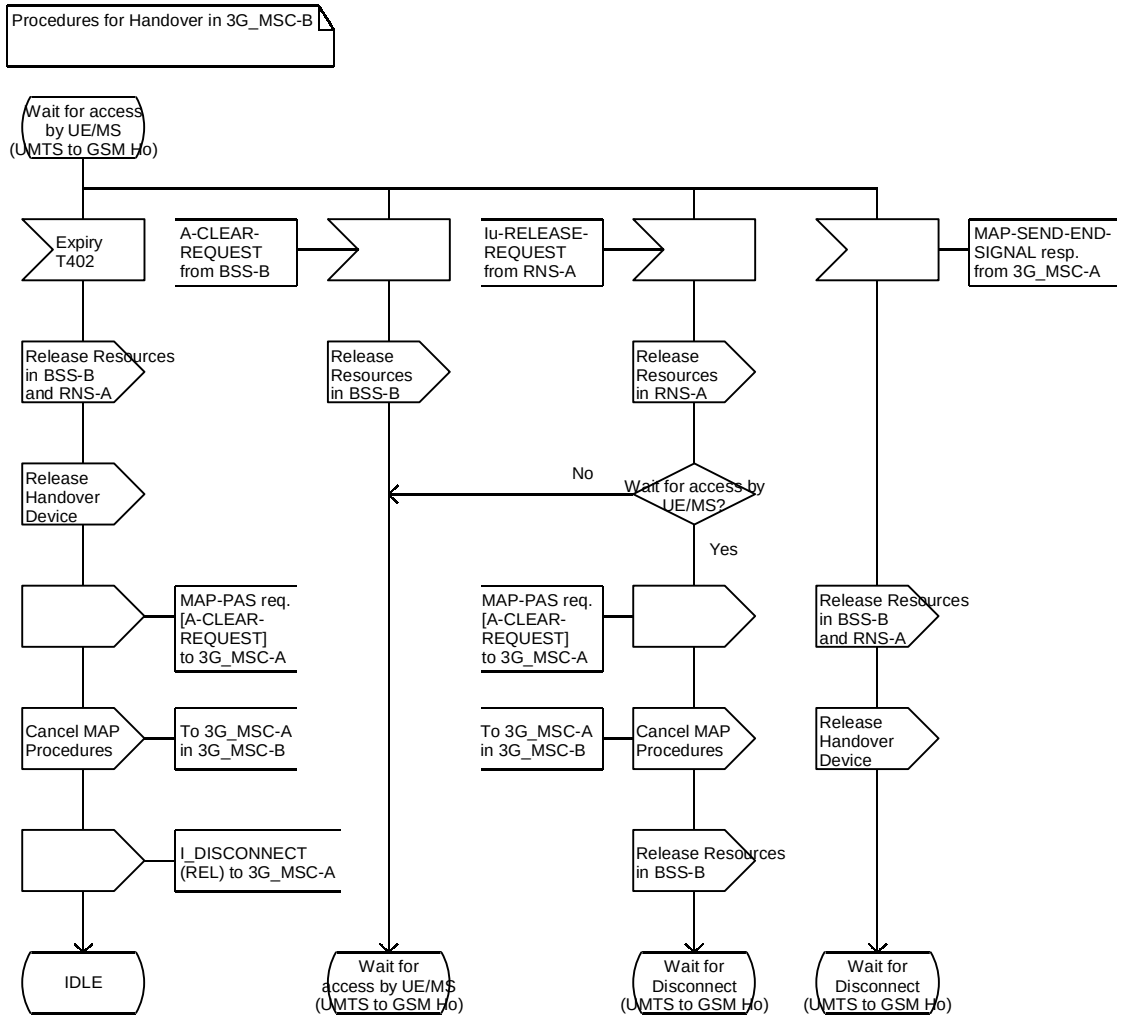
Procedures for Handover in 3G_MSC-B

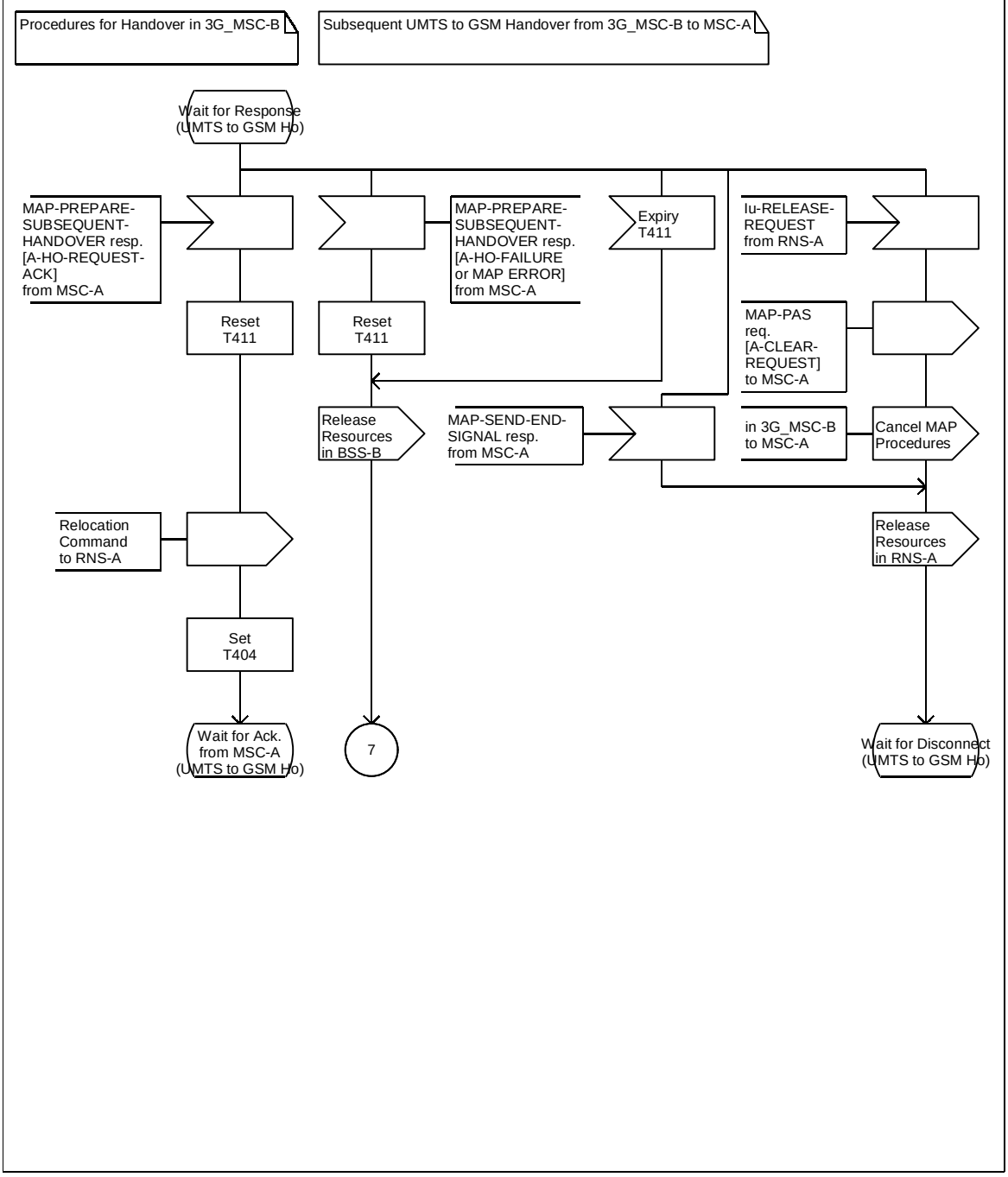
UMTS to GSM Handover from RNS-A to BSS-B on MSC-B

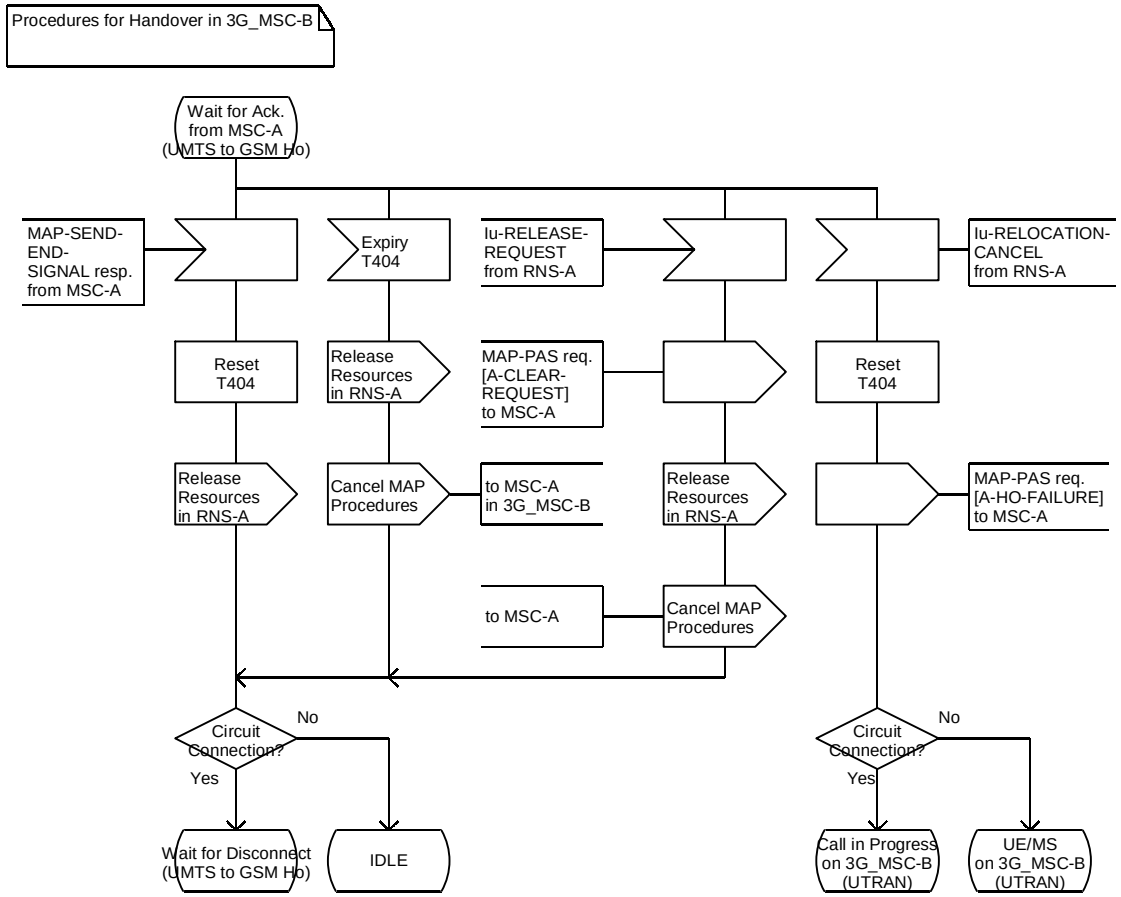



Procedures for Handover in 3G_MSC-B
Wait for access by UE/MS (UMTS to GSM Ho)
A-HANDOVER-COMPLETE from BSS-B
A-HANDOVER-DETECT form BSS-B
Iu-RELOCATION CANCEL from RNS-A
Reset T402
MAP-PAS req. [A-HO-PERFORMED] to 3G_MSC-A
Circuit Connection?
No
Yes
Connect Handover Device (Optional)
Forward queued messages via BSS-B
Release Resources in RNS-A
Release Handover Device
Call in Progress on 3G_MSC-B (GSM)
UE/MS on 3G_MSC-B (GSM)
Wait for access by UE/MS (UMTS to GSM Ho)
Reset T402
Forward queued messages via RNS-A
Release Resources in BSS-B
UE/MS on 3G_MSC-B (UTRAN)
Call in Progress on 3G_MSC-B (UTRAN)

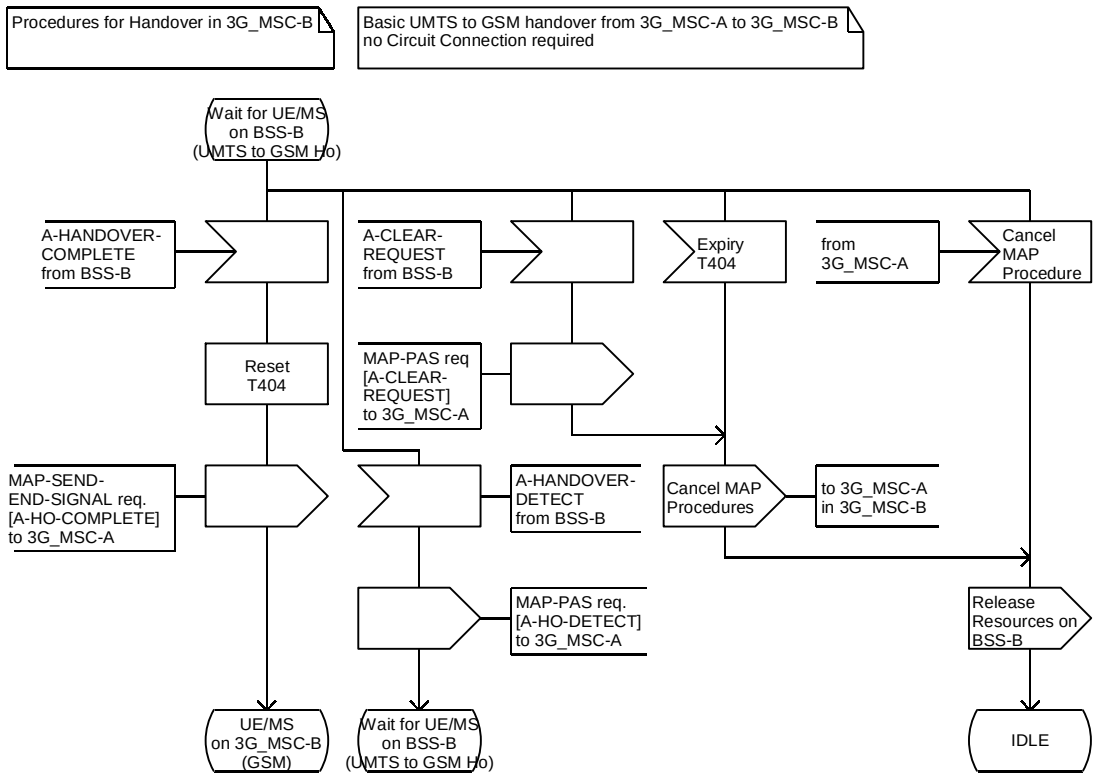
Procedure 3G_MSC_B_HO

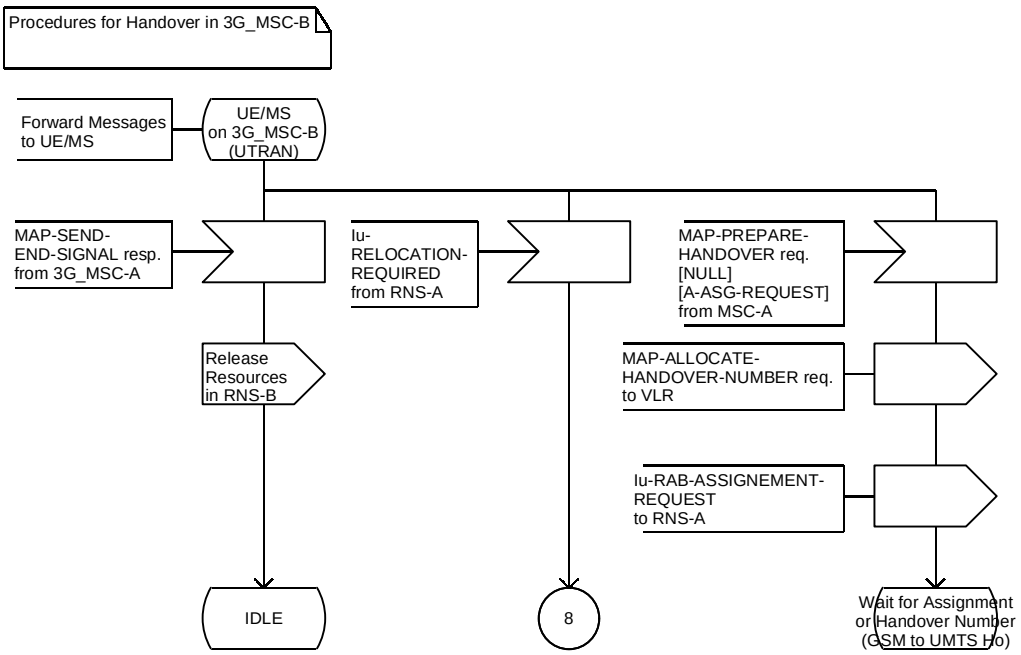



Procedures for Handover in 3G_MSC-B
Subsequent UMTS to GSM Handover from 3G_MSC-B to MSC-A
Wait for Response (UMTS to GSM Ho)
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-REQUEST-ACK] from MSC-A
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [A-HO-FAILURE or MAP ERROR] from MSC-A
Expiry T411
Iu-RELEASE-REQUEST from RNS-A
Reset T411
Reset T411
MAP-PAS req. [A-CLEAR-REQUEST] to MSC-A
Release Resources in BSS-B
MAP-SEND-END-SIGNAL resp. from MSC-A
in 3G_MSC-B to MSC-A
Cancel MAP Procedures
Relocation Command to RNS-A
Release Resources in RNS-A
Set T404
Wait for Ack. from MSC-A (UMTS to GSM Ho)
7
Wait for Disconnect (UMTS to GSM Ho)

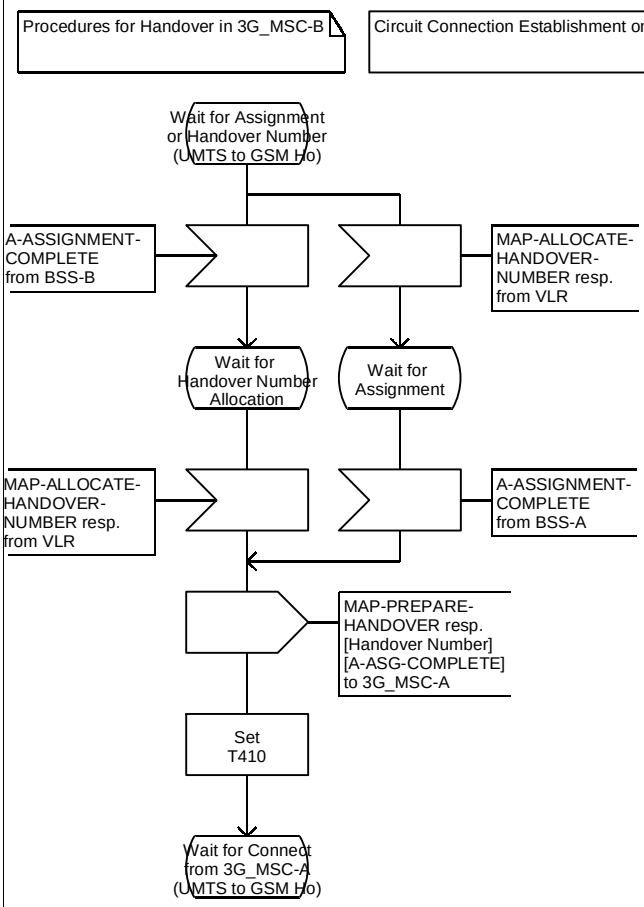

Procedures for Handover in 3G_MSC-B
Wait for Ack. from MSC-A (UMTS to GSM Ho)
MAP-SEND-END-SIGNAL resp. from MSC-A
Expiry T404
Iu-RELEASE-REQUEST from RNS-A
Iu-RELOCATION-CANCEL from RNS-A
Reset T404
Release Resources in RNS-A
MAP-PAS req. [A-CLEAR-REQUEST] to MSC-A
Reset T404
Release Resources in RNS-A
Cancel MAP Procedures
to MSC-A in 3G_MSC-B
Release Resources in RNS-A
MAP-PAS req. [A-HO-FAILURE] to MSC-A
to MSC-A
Cancel MAP Procedures
Circuit Connection?
No
Yes
Circuit Connection?
No
Yes
Wait for Disconnect (UMTS to GSM Ho)
IDLE
Call in Progress on 3G_MSC-B (UTRAN)
UE/MS on 3G_MSC-B (UTRAN)

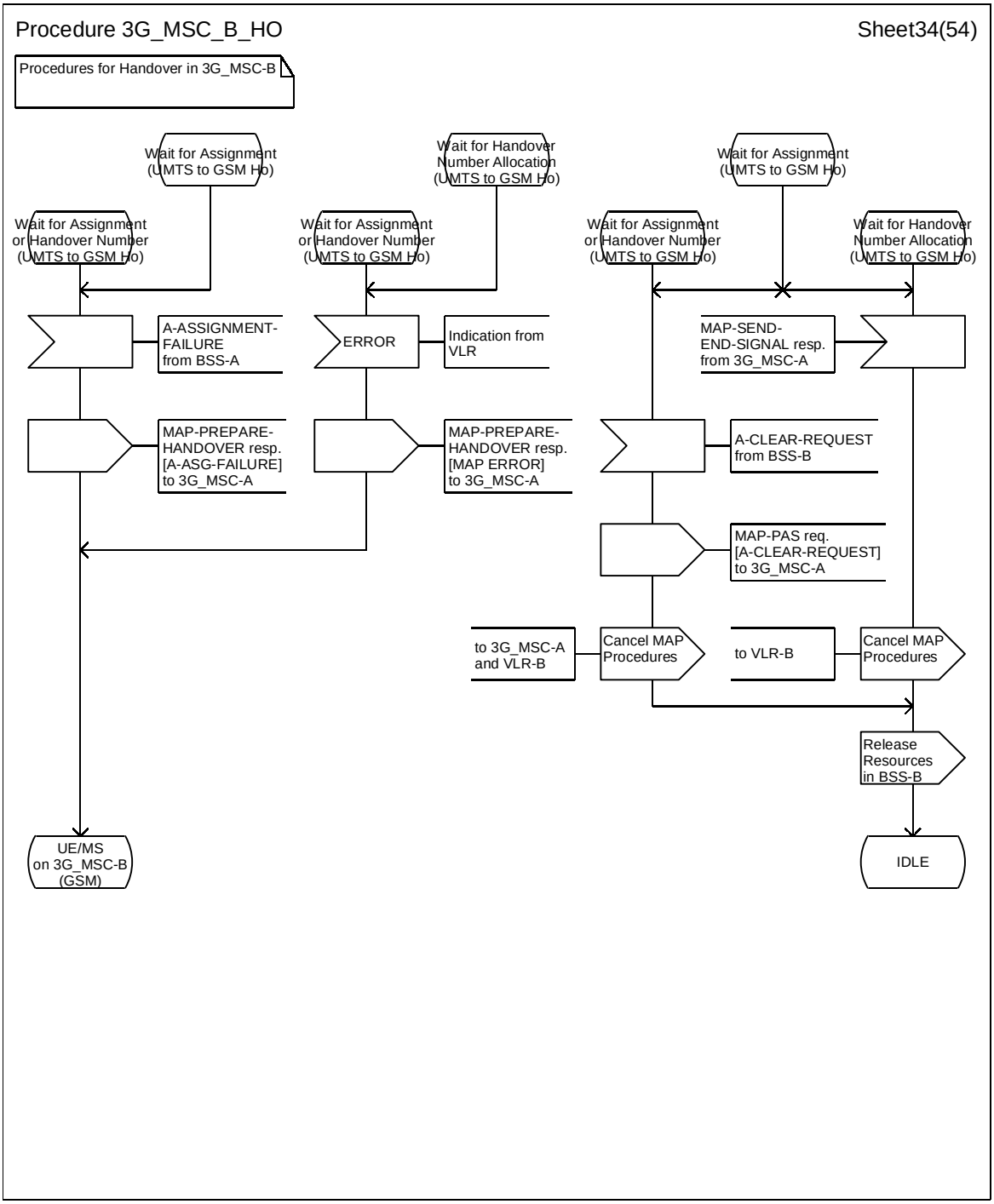
Procedure 3G_MSC_B_HO



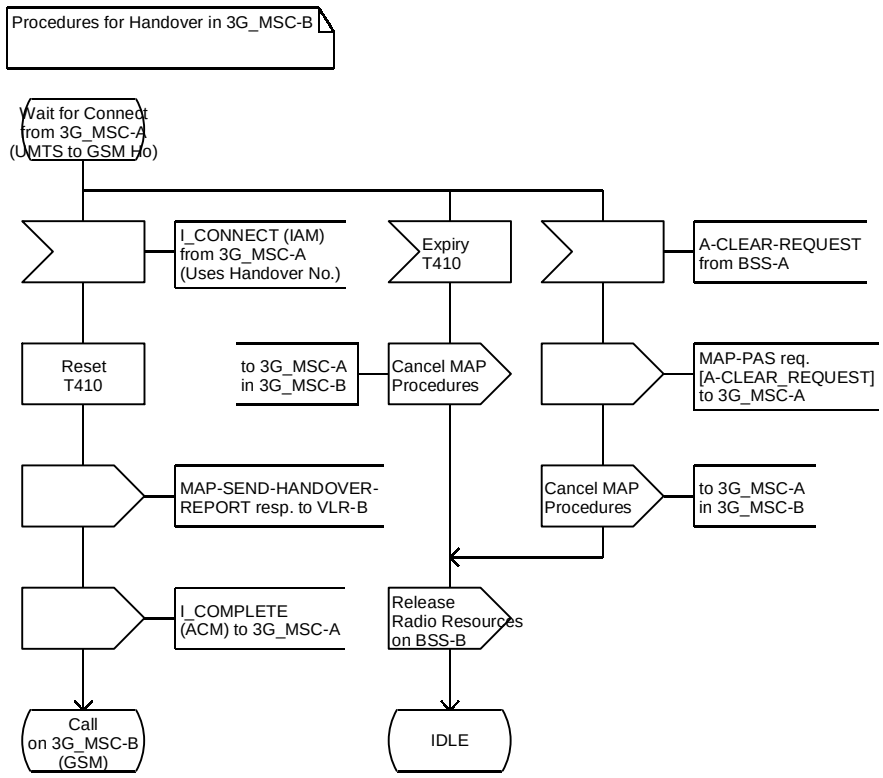

Procedures for Handover in 3G_MSC-B
Forward Messages to UE/MS
UE/MS on 3G_MSC-B (UTRAN)
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Iu-RELOCATION-REQUIRED from RNS-A
MAP-PREPARE-HANDOVER req. [NULL] [A-ASG-REQUEST] from MSC-A
Release Resources in RNS-B
MAP-ALLOCATE-HANDOVER-NUMBER req. to VLR
Iu-RAB-ASSIGNEMENT-REQUEST to RNS-A
IDLE
8
Wait for Assignment or Handover Number (GSM to UMTS Ho)

Procedure 3G_MSC_B_HO

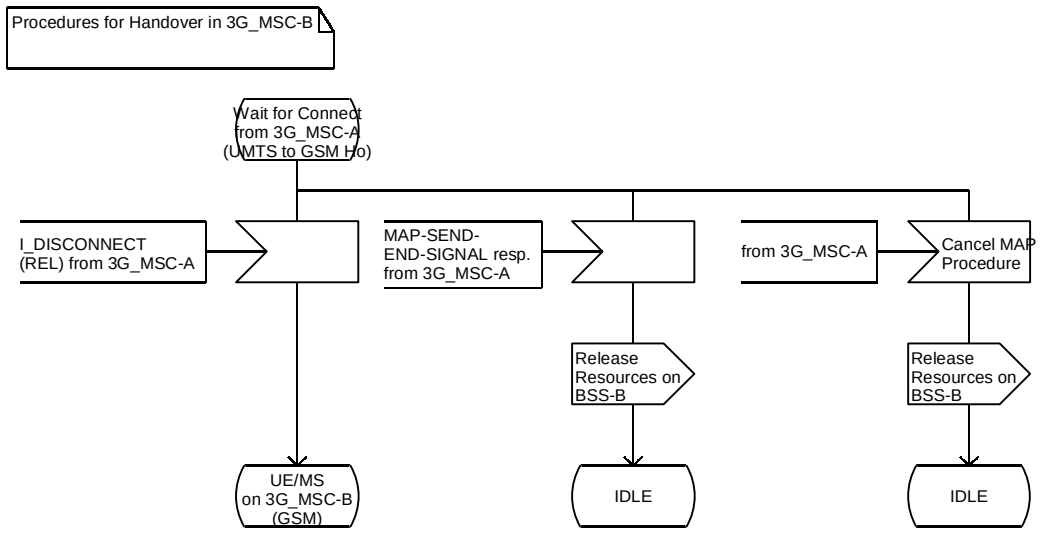


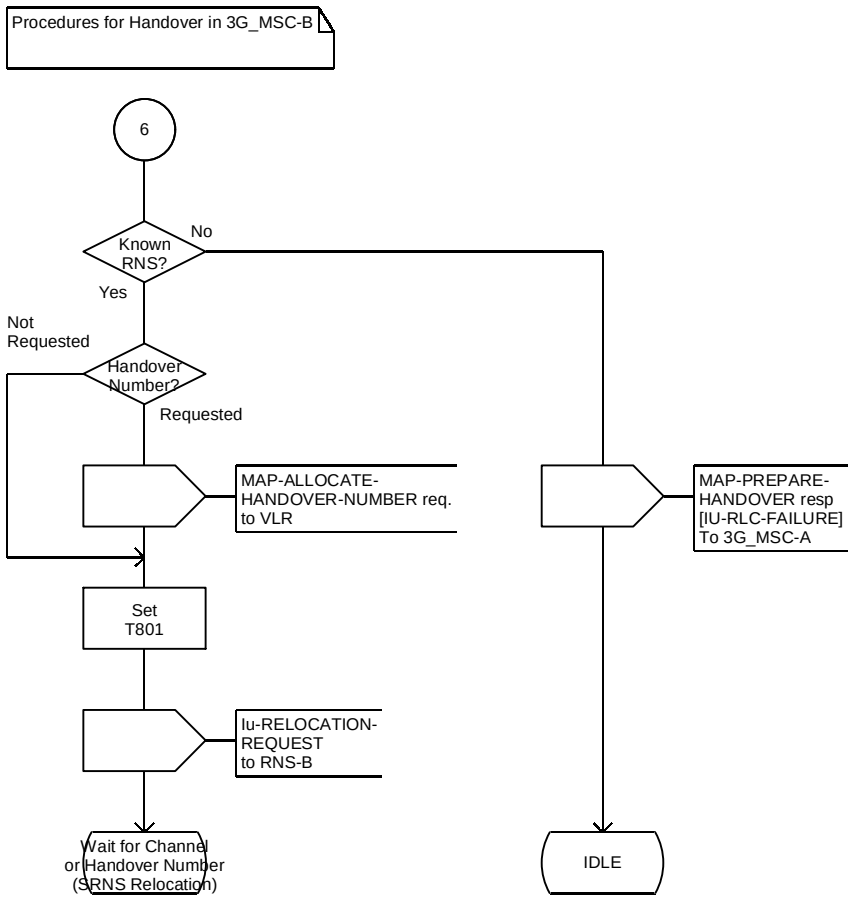

Procedures for Handover in 3G_MSC-B
Wait for Assignment (UMTS to GSM Ho)
Wait for Handover Number Allocation (UMTS to GSM Ho)
Wait for Assignment (UMTS to GSM Ho)
Wait for Assignment or Handover Number (UMTS to GSM Ho)
Wait for Assignment or Handover Number (UMTS to GSM Ho)
Wait for Assignment or Handover Number (UMTS to GSM Ho)
Wait for Handover Number Allocation (UMTS to GSM Ho)
A-ASSIGNMENT-FAILURE from BSS-A
ERROR
Indication from VLR
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
MAP-PREPARE-HANDOVER resp. [A-ASG-FAILURE] to 3G_MSC-A
MAP-PREPARE-HANDOVER resp. [MAP ERROR] to 3G_MSC-A
A-CLEAR-REQUEST from BSS-B
MAP-PAS req. [A-CLEAR-REQUEST] to 3G_MSC-A
to 3G_MSC-A and VLR-B
Cancel MAP Procedures
to VLR-B
Cancel MAP Procedures
Release Resources in BSS-B
UE/MS on 3G_MSC-B (GSM)
IDLE

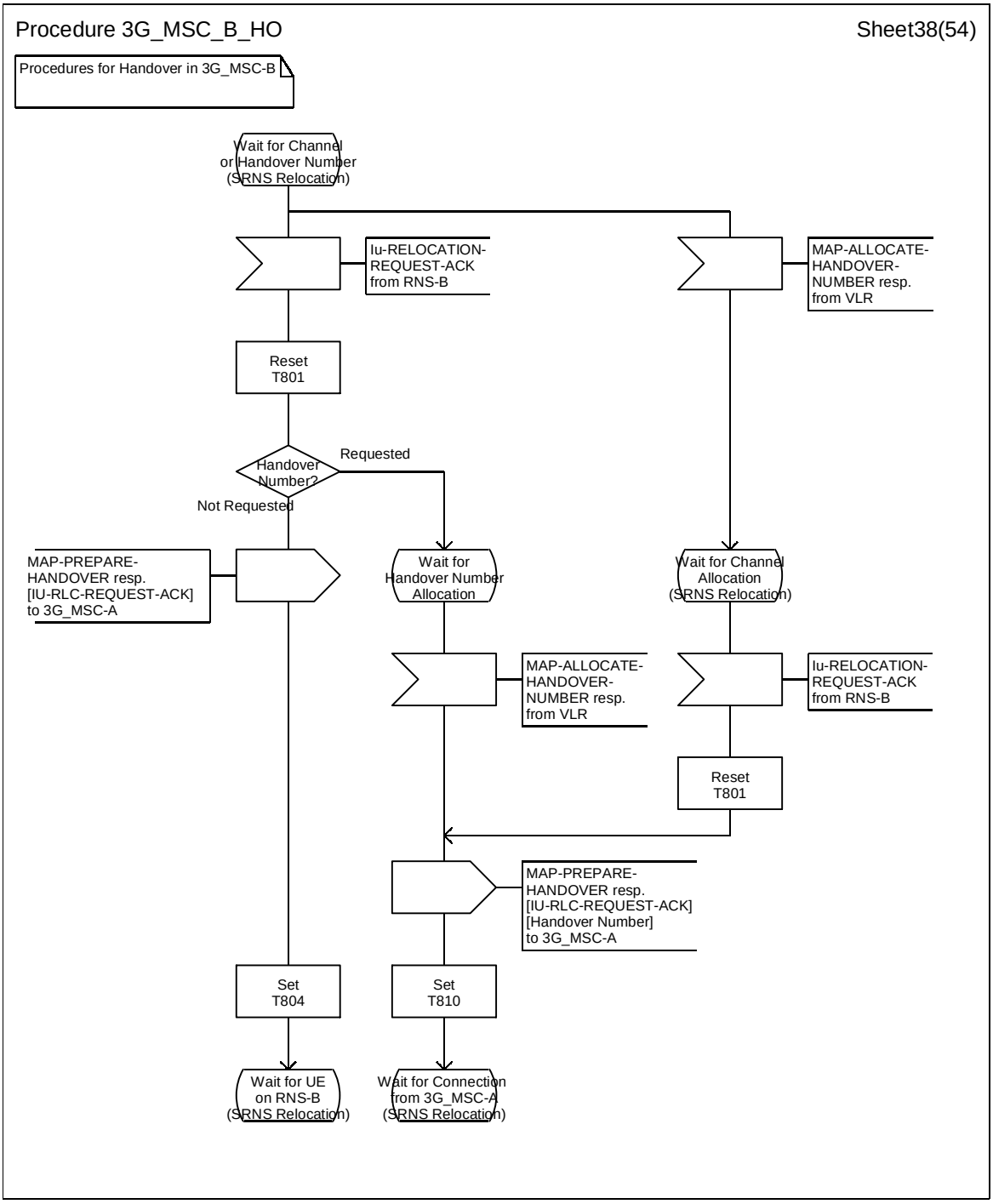
Procedure 3G_MSC_B_HO

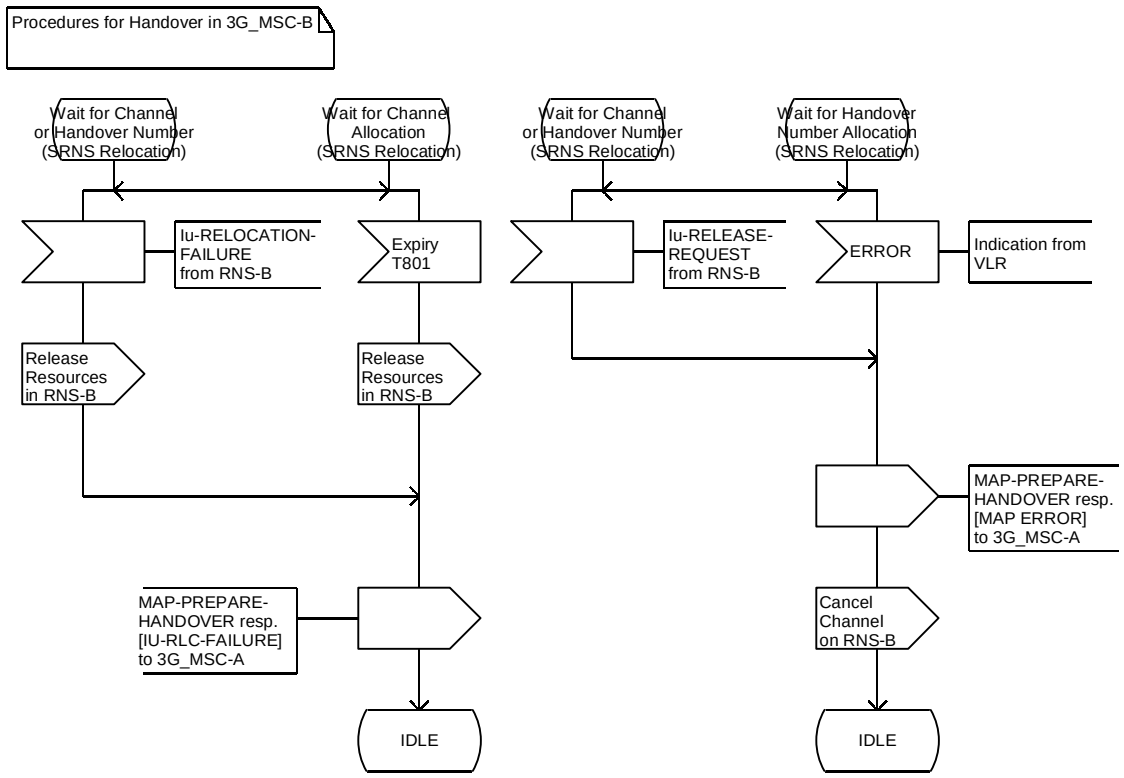


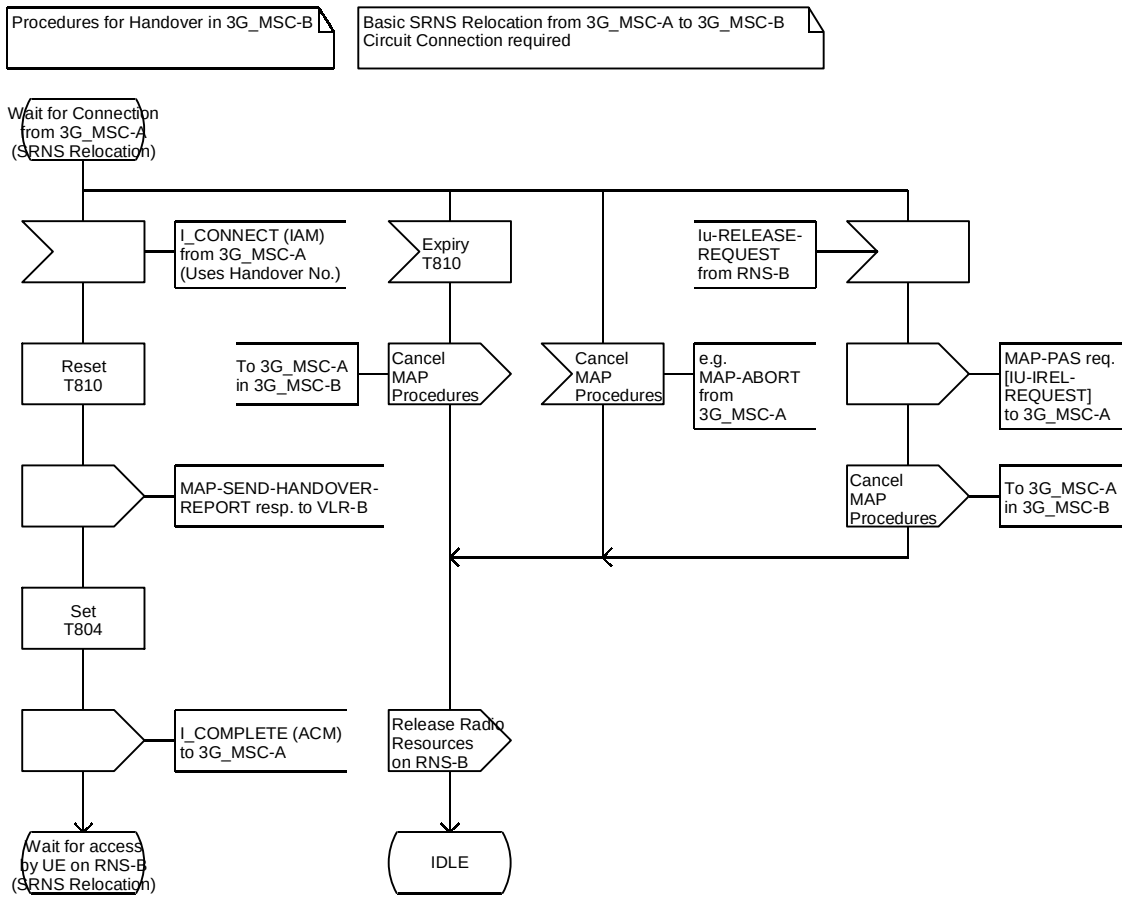
Procedure 3G_MSC_B_HO

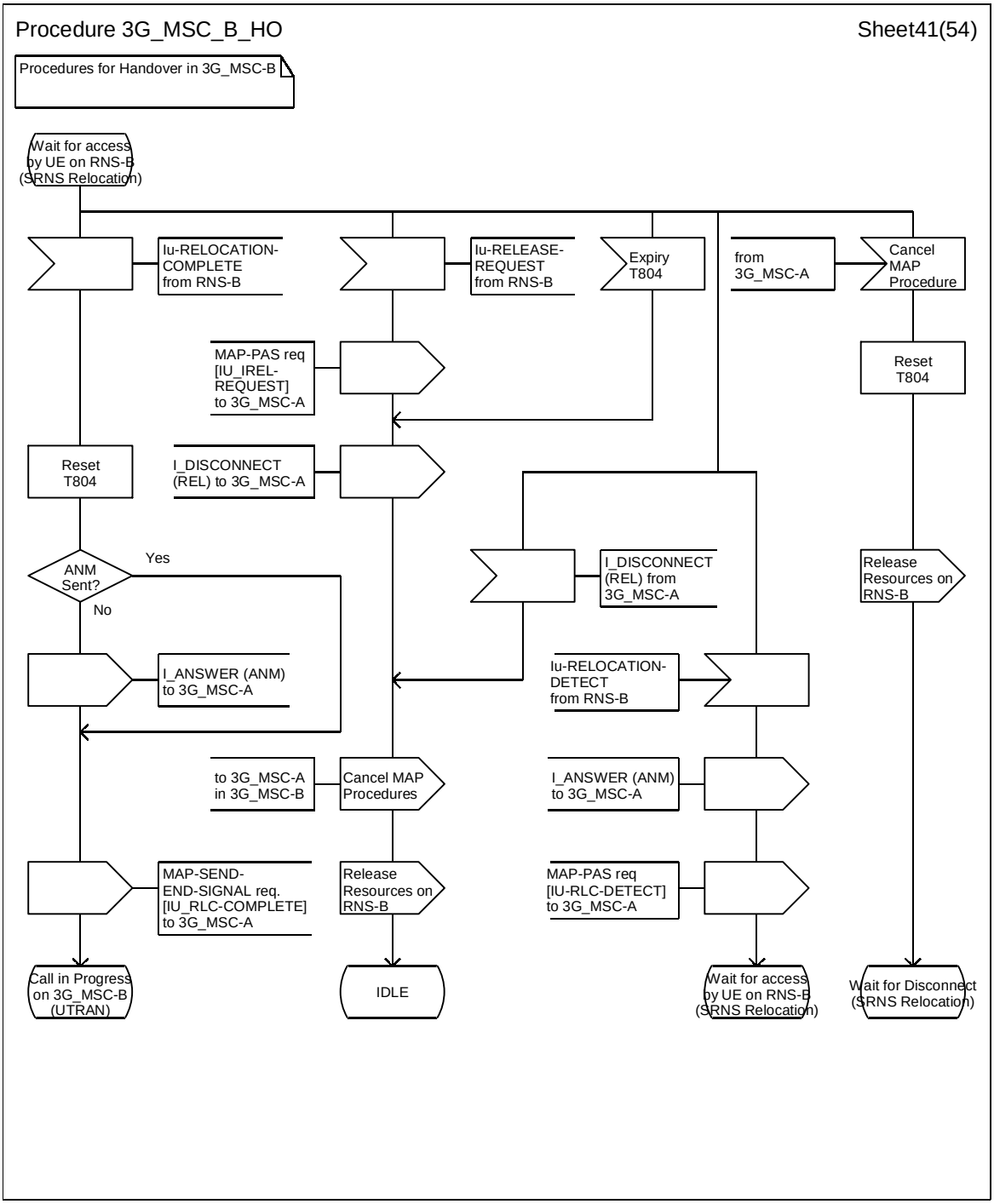


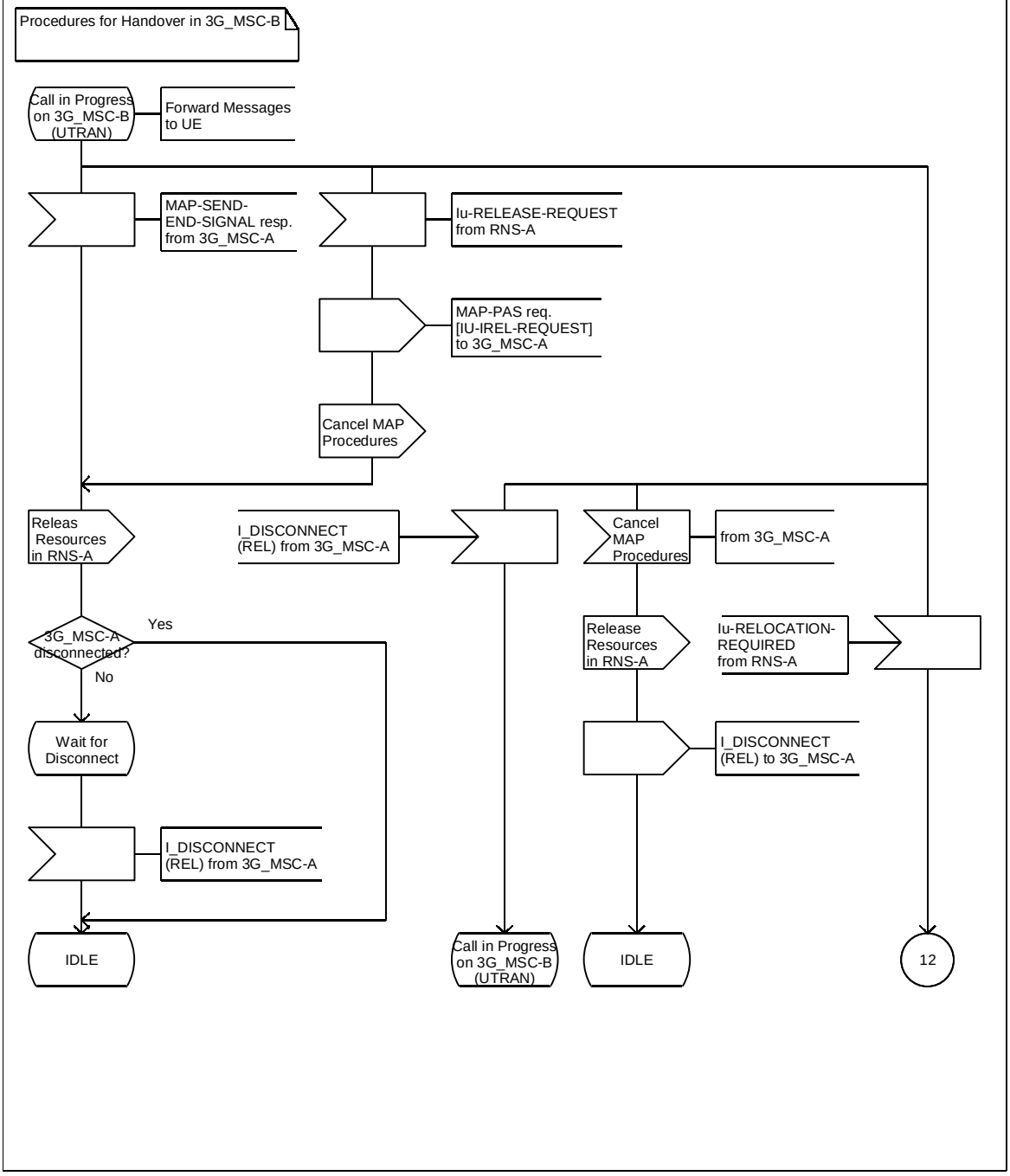

Procedures for Handover in 3G_MSC-B
6
Known RNS?
No
Yes
Not Requested
Handover Number?
Requested
MAP-ALLOCATE-HANDOVER-NUMBER req. to VLR
MAP-PREPARE-HANDOVER resp [IU-RLC-FAILURE] To 3G_MSC-A
Set T801
Iu-RELOCATION-REQUEST to RNS-B
Wait for Channel or Handover Number (SRNS Relocation)
IDLE

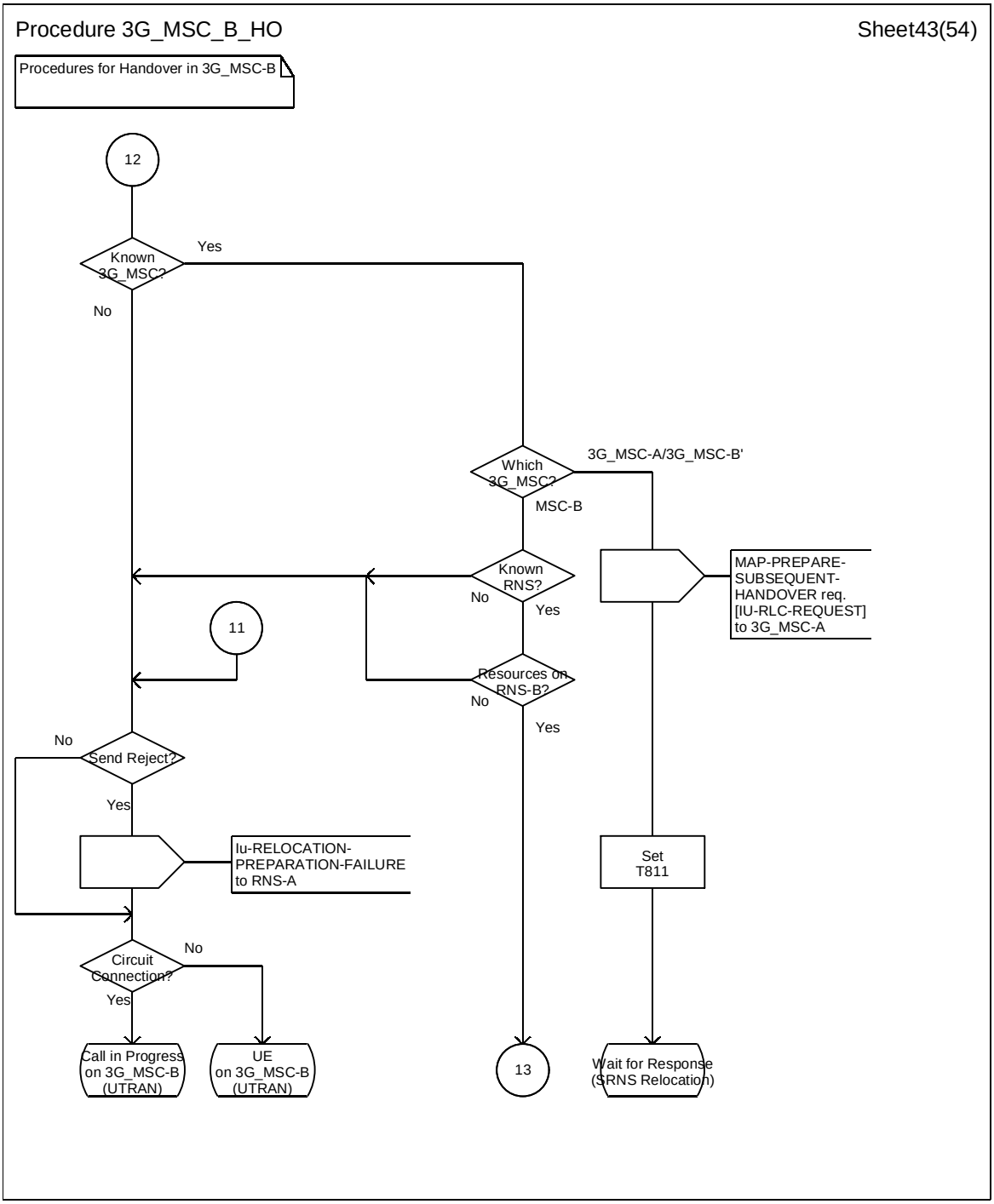

Procedures for Handover in 3G_MSC-B
Wait for Channel or Handover Number (SRNS Relocation)
Iu-RELOCATION-REQUEST-ACK from RNS-B
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Reset T801
Handover Number?
Requested
Not Requested
MAP-PREPARE-HANDOVER resp. [IU-RLC-REQUEST-ACK] to 3G_MSC-A
Wait for Handover Number Allocation
Wait for Channel Allocation (SRNS Relocation)
MAP-ALLOCATE-HANDOVER-NUMBER resp. from VLR
Iu-RELOCATION-REQUEST-ACK from RNS-B
Reset T801
MAP-PREPARE-HANDOVER resp. [IU-RLC-REQUEST-ACK] [Handover Number] to 3G_MSC-A
Set T804
Set T810
Wait for UE on RNS-B (SRNS Relocation)
Wait for Connection from 3G_MSC-A (SRNS Relocation)


Procedures for Handover in 3G_MSC-B
Wait for Channel or Handover Number (SRNS Relocation)
Wait for Channel Allocation (SRNS Relocation)
Wait for Channel or Handover Number (SRNS Relocation)
Wait for Handover Number Allocation (SRNS Relocation)
Iu-RELOCATION-FAILURE from RNS-B
Expiry T801
Iu-RELEASE-REQUEST from RNS-B
ERROR
Indication from VLR
Release Resources in RNS-B
Release Resources in RNS-B
MAP-PREPARE-HANDOVER resp. [MAP ERROR] to 3G_MSC-A
MAP-PREPARE-HANDOVER resp. [IU-RLC-FAILURE] to 3G_MSC-A
Cancel Channel on RNS-B
IDLE
IDLE


Procedures for Handover in 3G_MSC-B
Basic SRNS Relocation from 3G_MSC-A to 3G_MSC-B
Circuit Connection required
Wait for Connection from 3G_MSC-A (SRNS Relocation)
I_CONNECT (IAM) from 3G_MSC-A (Uses Handover No.)
Expiry T810
Iu-RELEASE-REQUEST from RNS-B
Reset T810
To 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
Cancel MAP Procedures
e.g. MAP-ABORT from 3G_MSC-A
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
MAP-SEND-HANDOVER-REPORT resp. to VLR-B
Cancel MAP Procedures
To 3G_MSC-A in 3G_MSC-B
Set T804
I_COMPLETE (ACM) to 3G_MSC-A
Release Radio Resources on RNS-B
Wait for access by UE on RNS-B (SRNS Relocation)
IDLE

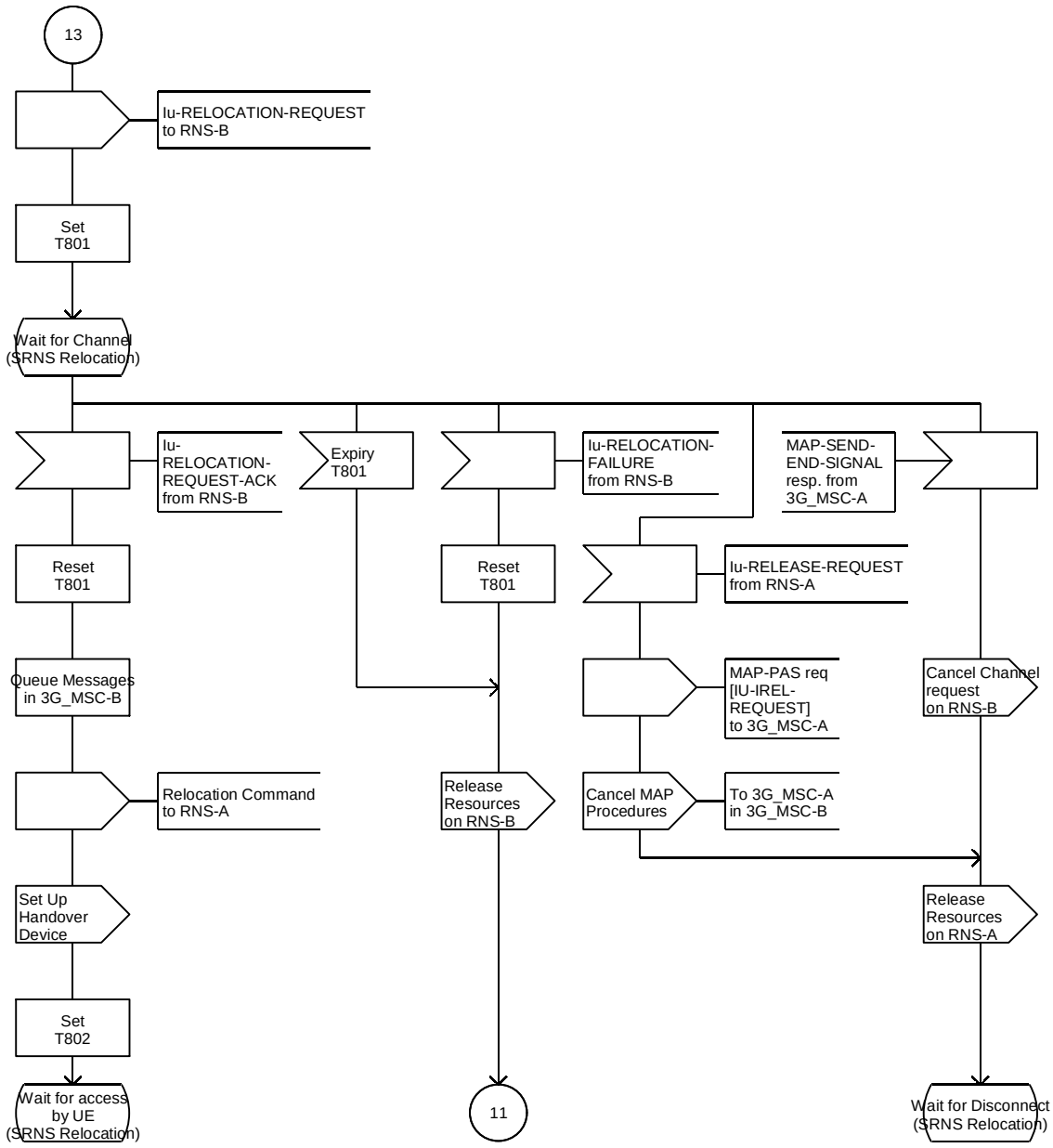

Procedures for Handover in 3G_MSC-B
Wait for access by UE on RNS-B (SRNS Relocation)
Iu-RELOCATION-COMPLETE from RNS-B
Iu-RELEASE-REQUEST from RNS-B
Expiry T804
from 3G_MSC-A
Cancel MAP Procedure
MAP-PAS req [IU_IREL-REQUEST] to 3G_MSC-A
Reset T804
Reset T804
I_DISCONNECT (REL) to 3G_MSC-A
ANM Sent?
Yes
No
I_DISCONNECT (REL) from 3G_MSC-A
Release Resources on RNS-B
I_ANSWER (ANM) to 3G_MSC-A
Iu-RELOCATION-DETECT from RNS-B
to 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
I_ANSWER (ANM) to 3G_MSC-A
MAP-SEND-END-SIGNAL req. [IU_RLC-COMPLETE] to 3G_MSC-A
Release Resources on RNS-B
MAP-PAS req [IU-RLC-DETECT] to 3G_MSC-A
Call in Progress on 3G_MSC-B (UTRAN)
IDLE
Wait for access by UE on RNS-B (SRNS Relocation)
Wait for Disconnect (SRNS Relocation)


Procedures for Handover in 3G_MSC-B
Call in Progress on 3G_MSC-B (UTRAN)
Forward Messages to UE
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Iu-RELEASE-REQUEST from RNS-A
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
Cancel MAP Procedures
Releas Resources in RNS-A
I_DISCONNECT (REL) from 3G_MSC-A
Cancel MAP Procedures
from 3G_MSC-A
3G_MSC-A disconnected?
Yes
No
Release Resources in RNS-A
Iu-RELOCATION-REQUIRED from RNS-A
Wait for Disconnect
I_DISCONNECT (REL) to 3G_MSC-A
I_DISCONNECT (REL) from 3G_MSC-A
IDLE
Call in Progress on 3G_MSC-B (UTRAN)
IDLE
12


Procedures for Handover in 3G_MSC-B
12
Known 3G_MSC?
Yes
No
Which 3G_MSC?
3G_MSC-A/3G_MSC-B'
MSC-B
Known RNS?
No
Yes
MAP-PREPARE-SUBSEQUENT-HANDOVER req. [IU-RLC-REQUEST] to 3G_MSC-A
11
Resources on RNS-B?
No
Yes
No
Send Reject?
Yes
Iu-RELOCATION-PREPARATION-FAILURE to RNS-A
Set T811
No
Circuit Connection?
Yes
Call in Progress on 3G_MSC-B (UTRAN)
UE on 3G_MSC-B (UTRAN)
13
Wait for Response ($RNS Relocation)

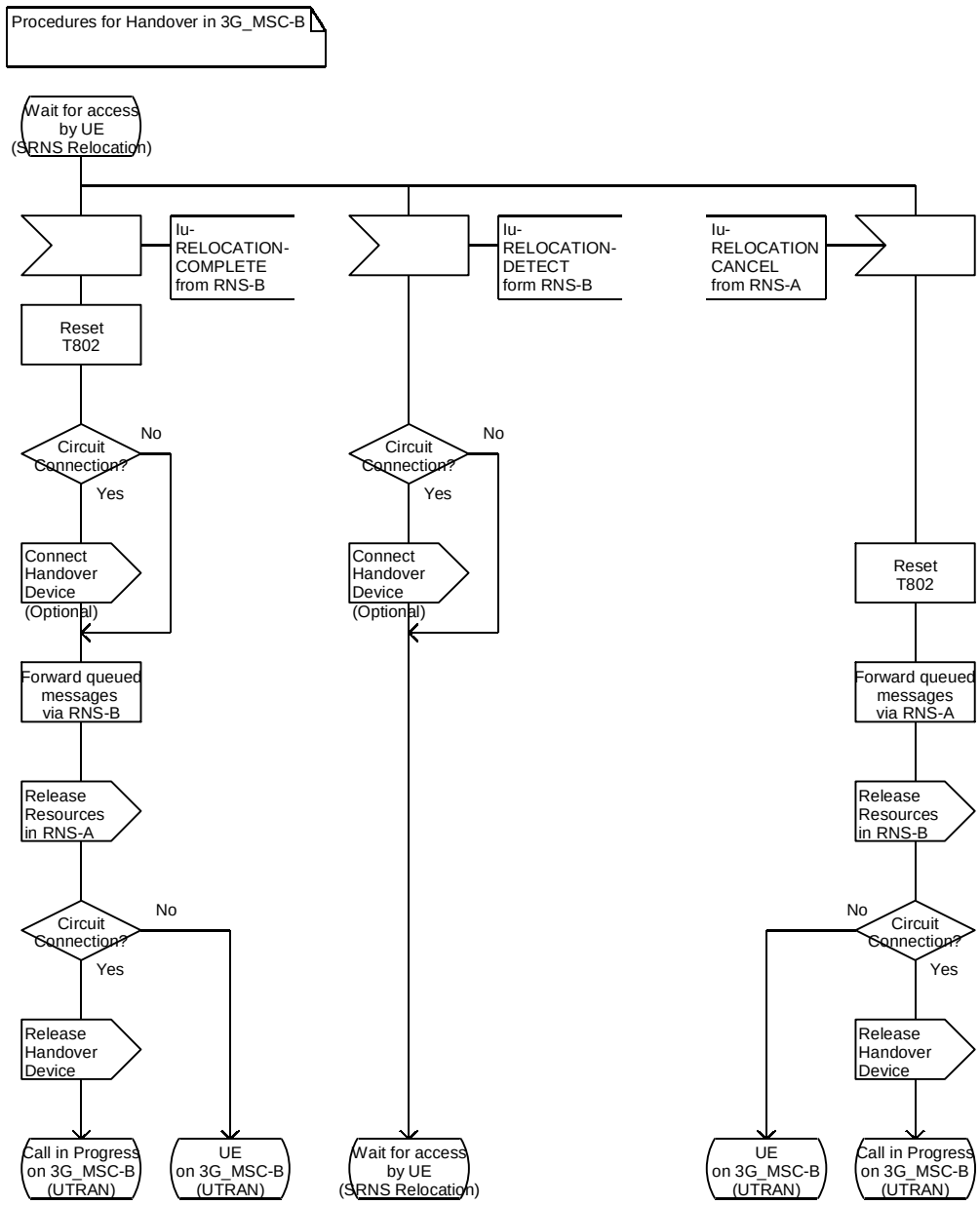
Procedures for Handover in 3G_MSC-B

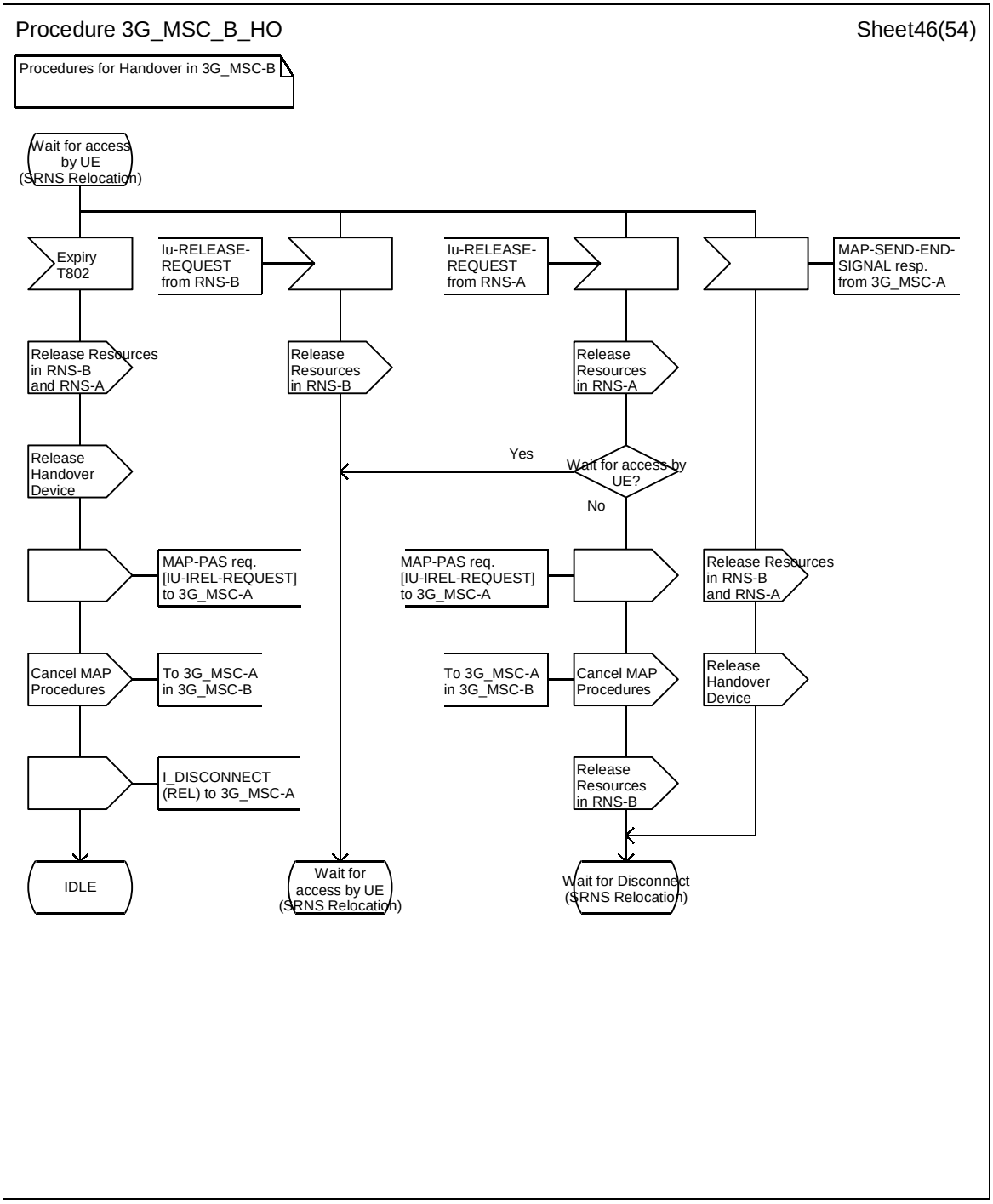
SRNS Relocation from RNS-A to RNS-B on 3G_MSC-B

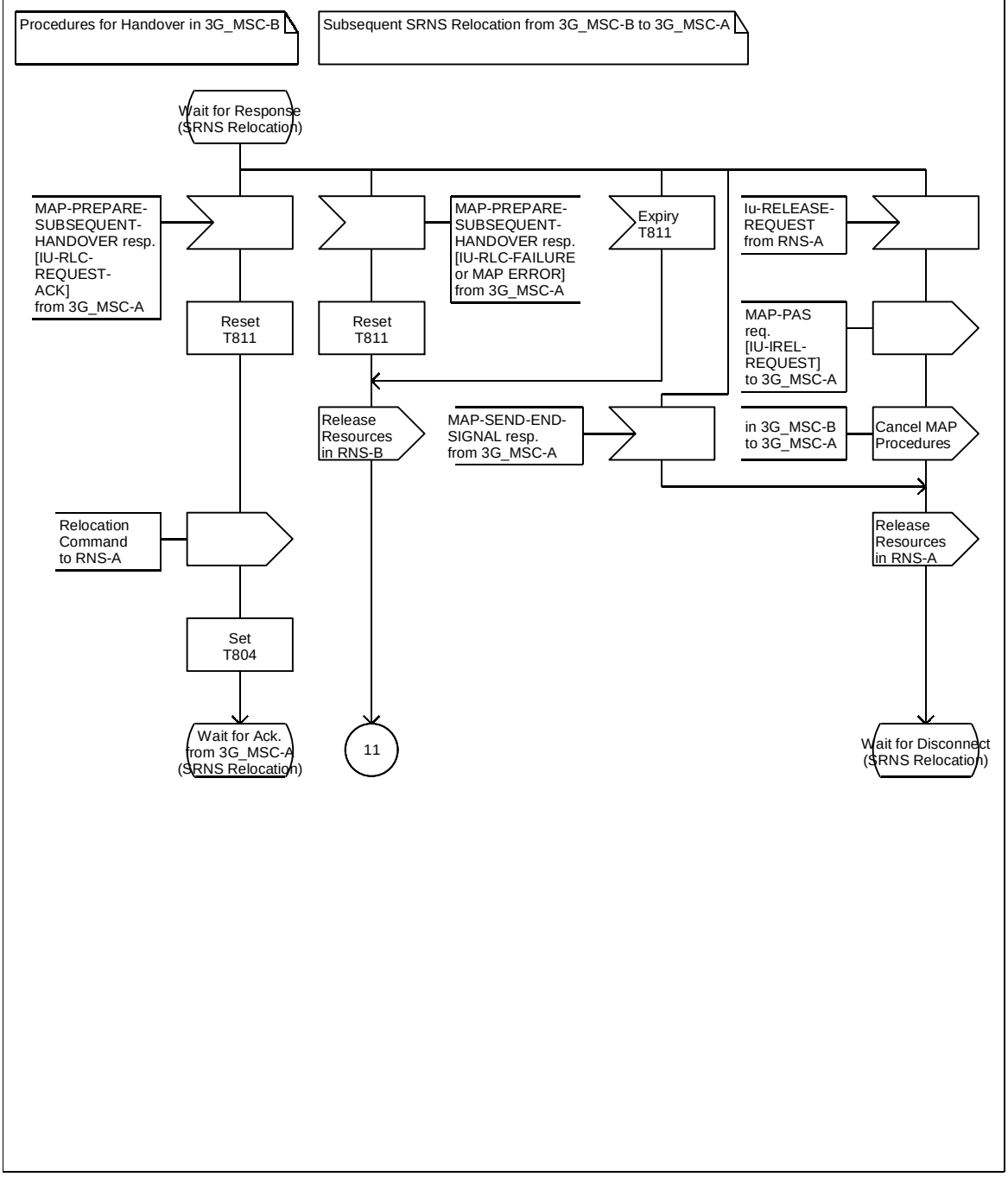


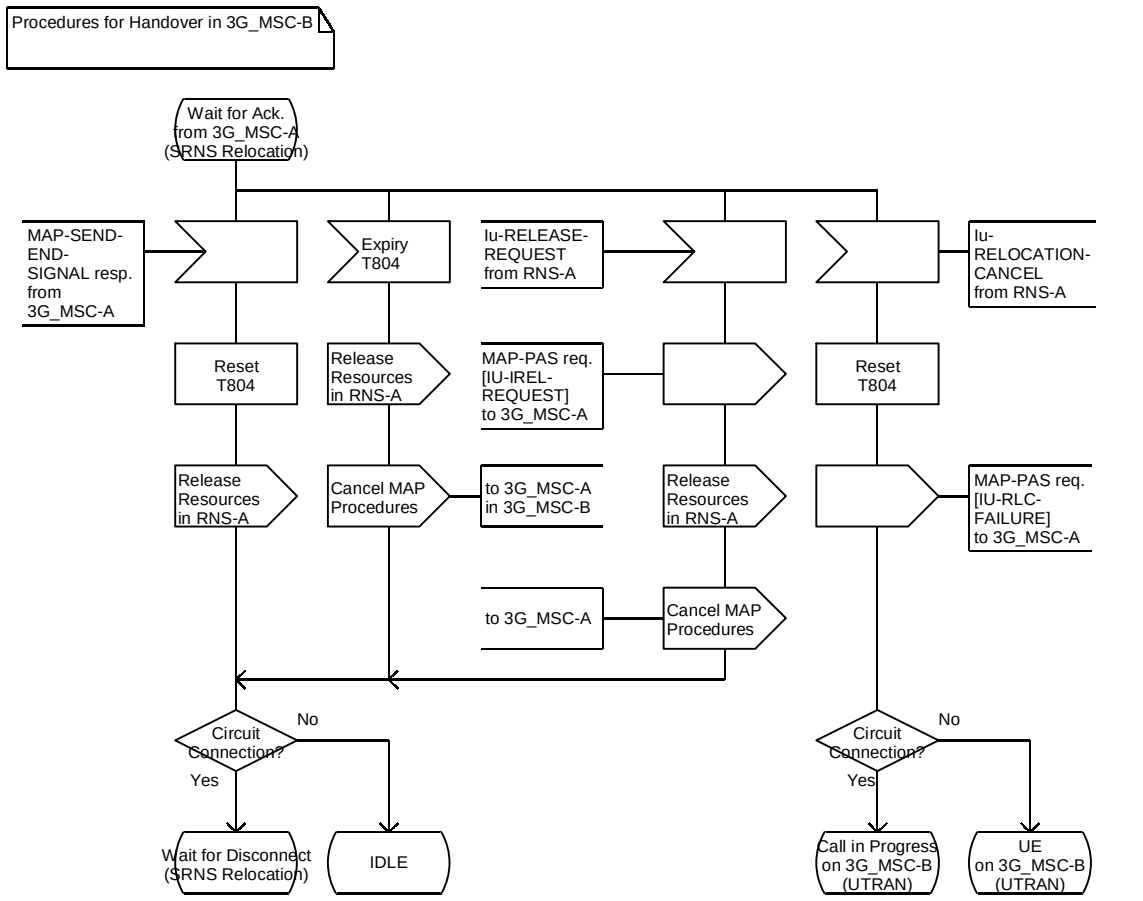
Procedure 3G_MSC_B_HO

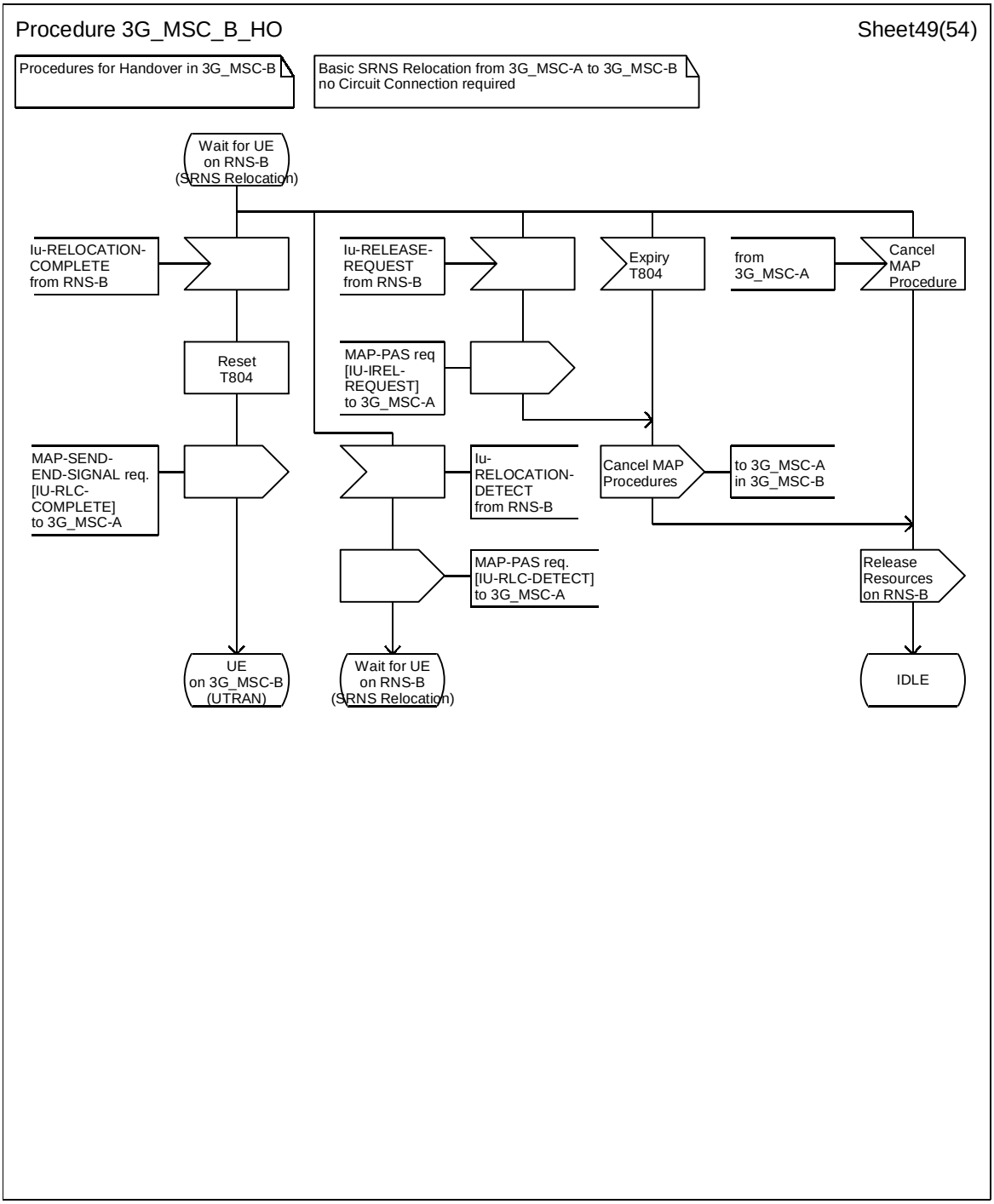
Sheet45(54)




Procedures for Handover in 3G_MSC-B
Wait for access by UE (SRNS Relocation)
Expiry T802
Iu-RELEASE-REQUEST from RNS-B
Iu-RELEASE-REQUEST from RNS-A
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Release Resources in RNS-B and RNS-A
Release Resources in RNS-B
Release Resources in RNS-A
Release Handover Device
Yes
Wait for access by UE?
No
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
Release Resources in RNS-B and RNS-A
Cancel MAP Procedures
To 3G_MSC-A in 3G_MSC-B
To 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
Release Handover Device
I_DISCONNECT (REL) to 3G_MSC-A
Release Resources in RNS-B
IDLE
Wait for access by UE (SRNS Relocation)
Wait for Disconnect (SRNS Relocation)

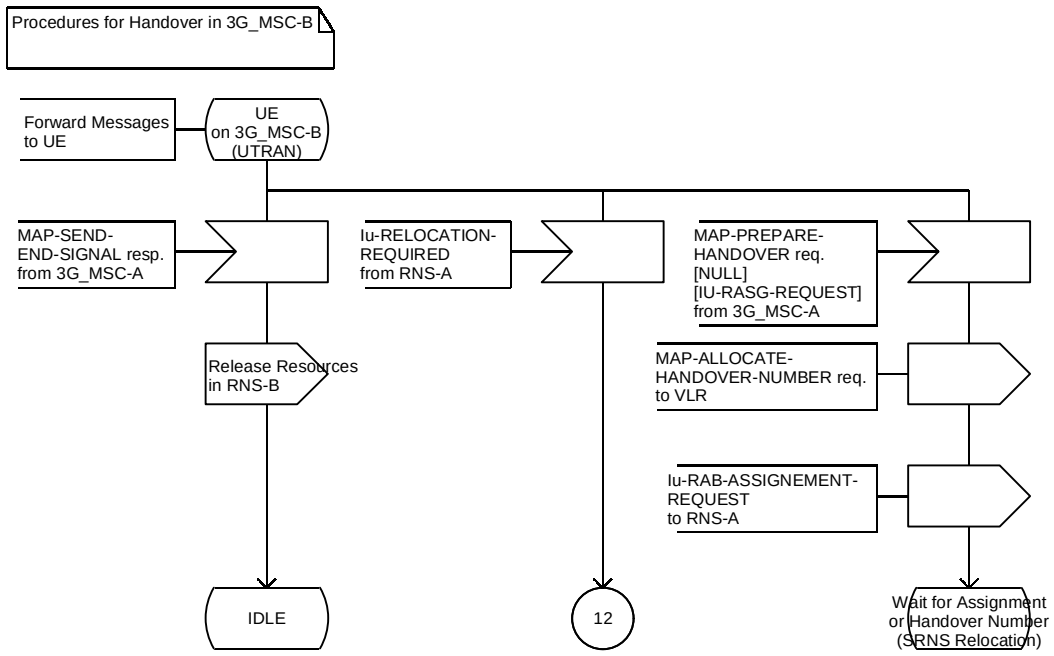

Procedures for Handover in 3G_MSC-B
Subsequent SRNS Relocation from 3G_MSC-B to 3G_MSC-A
Wait for Response (SRNS Relocation)
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [IU-RLC-REQUEST-ACK] from 3G_MSC-A
MAP-PREPARE-SUBSEQUENT-HANDOVER resp. [IU-RLC-FAILURE or MAP ERROR] from 3G_MSC-A
Expiry T811
Iu-RELEASE-REQUEST from RNS-A
Reset T811
Reset T811
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
Release Resources in RNS-B
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
in 3G_MSC-B to 3G_MSC-A
Cancel MAP Procedures
Relocation Command to RNS-A
Release Resources in RNS-A
Set T804
Wait for Ack. from 3G_MSC-A (SRNS Relocation)
11
Wait for Disconnect (SRNS Relocation)


Procedures for Handover in 3G_MSC-B
Wait for Ack. from 3G_MSC-A (SRNS Relocation)
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
Expiry T804
Iu-RELEASE-REQUEST from RNS-A
Iu-RELOCATION-CANCEL from RNS-A
Reset T804
Release Resources in RNS-A
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
Reset T804
Release Resources in RNS-A
Cancel MAP Procedures
to 3G_MSC-A in 3G_MSC-B
Release Resources in RNS-A
MAP-PAS req. [IU-RLC-FAILURE] to 3G_MSC-A
to 3G_MSC-A
Cancel MAP Procedures
Circuit Connection?
No
Yes
Circuit Connection?
No
Yes
Wait for Disconnect (SRNS Relocation)
IDLE
Call in Progress on 3G_MSC-B (UTRAN)
UE on 3G_MSC-B (UTRAN)

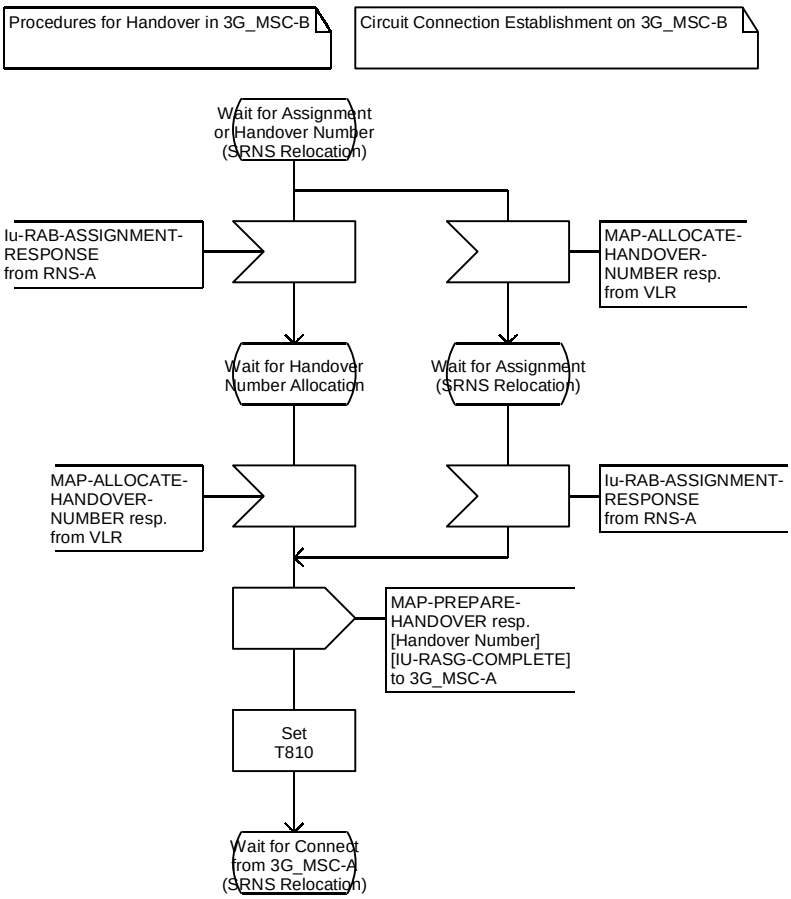

Procedures for Handover in 3G_MSC-B
Basic SRNS Relocation from 3G_MSC-A to 3G_MSC-B
no Circuit Connection required
Wait for UE on RNS-B (SRNS Relocation)
Iu-RELOCATION-COMPLETE from RNS-B
Iu-RELEASE-REQUEST from RNS-B
Expiry T804
from 3G_MSC-A
Cancel MAP Procedure
Reset T804
MAP-PAS req [IU-IREL-REQUEST] to 3G_MSC-A
MAP-SEND-END-SIGNAL req. [IU-RLC-COMPLETE] to 3G_MSC-A
Iu-RELOCATION-DETECT from RNS-B
Cancel MAP Procedures
to 3G_MSC-A in 3G_MSC-B
MAP-PAS req. [IU-RLC-DETECT] to 3G_MSC-A
Release Resources on RNS-B
UE on 3G_MSC-B (UTRAN)
Wait for UE on RNS-B (SRNS Relocation)
IDLE

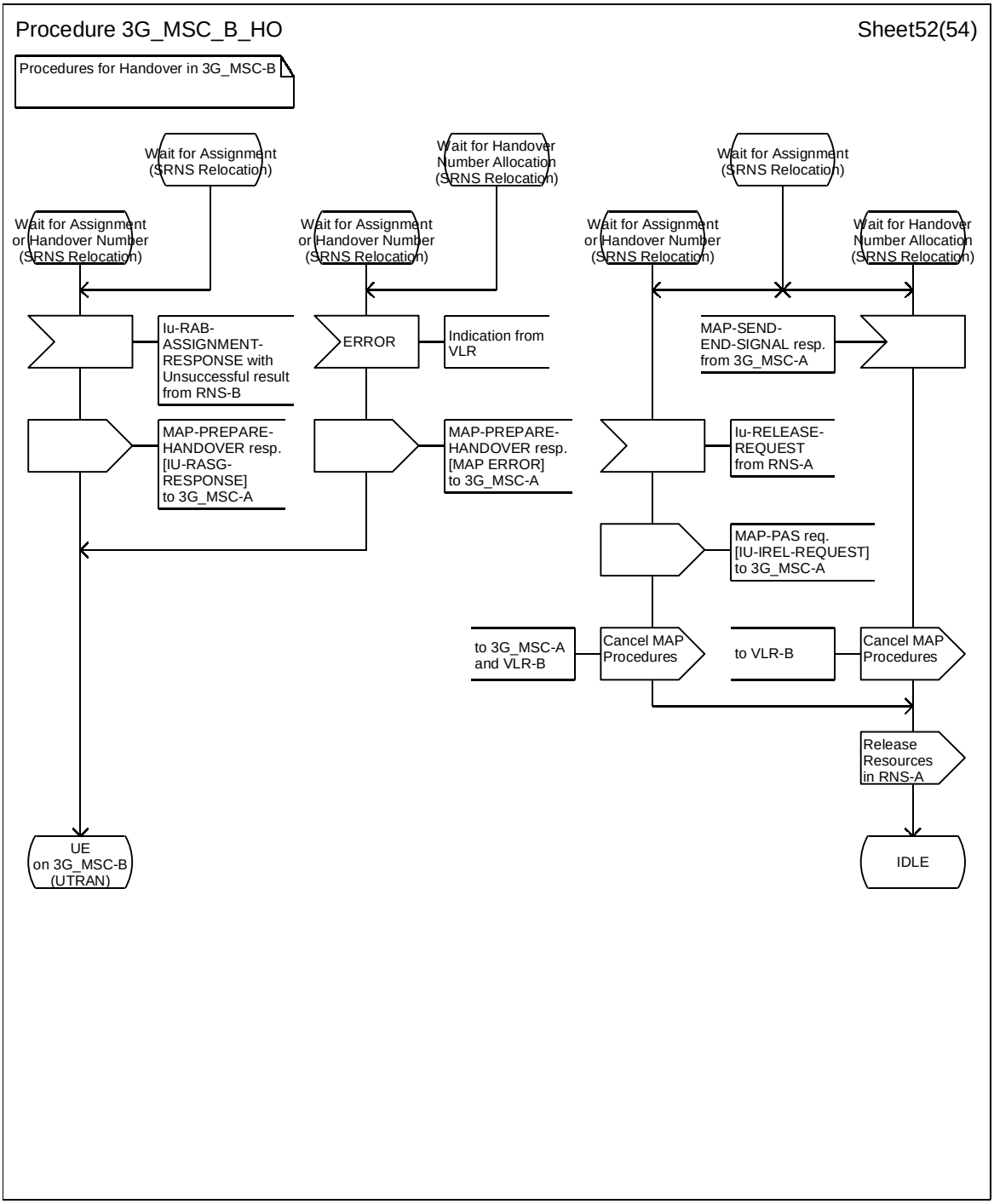
Procedure 3G_MSC_B_HO

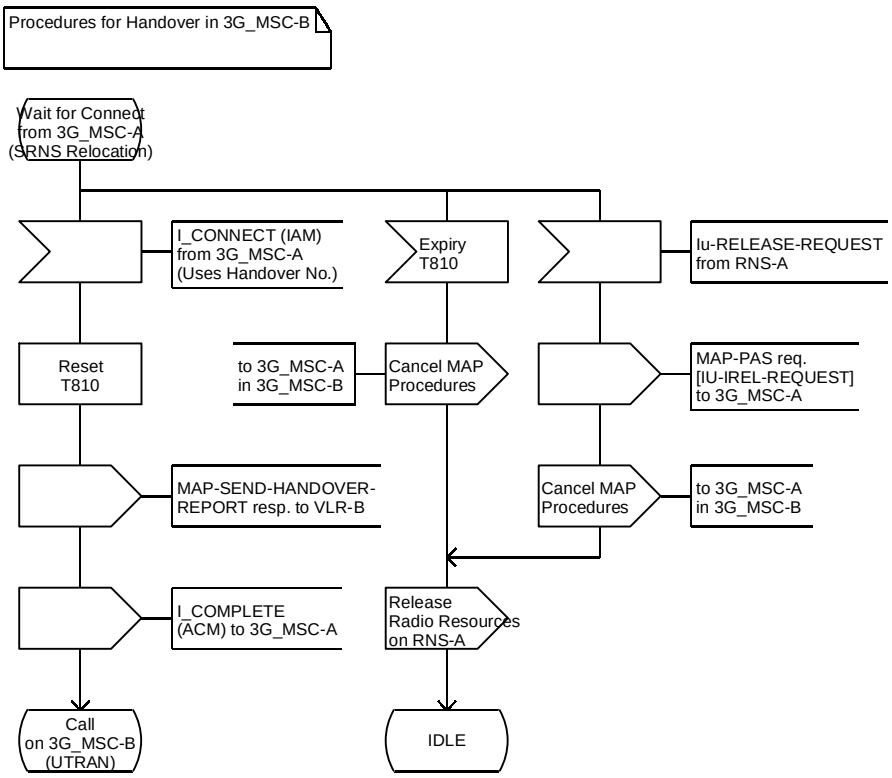
Sheet50(54)



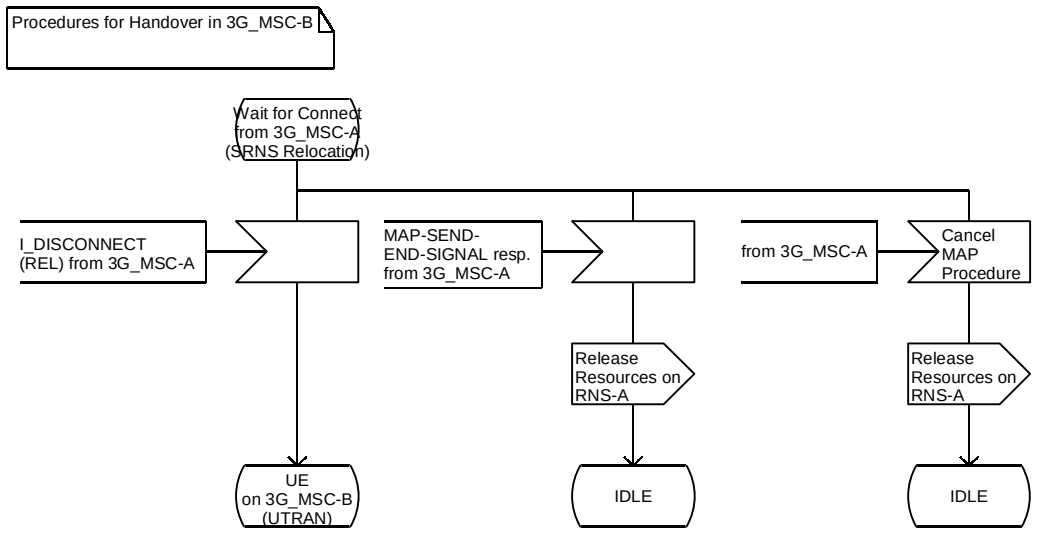
Procedure 3G_MSC_B_HO




Procedures for Handover in 3G_MSC-B
Wait for Assignment (SRNS Relocation)
Wait for Handover Number Allocation (SRNS Relocation)
Wait for Assignment (SRNS Relocation)
Wait for Assignment or Handover Number (SRNS Relocation)
Wait for Assignment or Handover Number (SRNS Relocation)
Wait for Assignment or Handover Number (SRNS Relocation)
Wait for Handover Number Allocation (SRNS Relocation)
Iu-RAB-ASSIGNMENT-RESPONSE with Unsuccessful result from RNS-B
ERROR
Indication from VLR
MAP-SEND-END-SIGNAL resp. from 3G_MSC-A
MAP-PREPARE-HANDOVER resp. [IU-RASG-RESPONSE] to 3G_MSC-A
MAP-PREPARE-HANDOVER resp. [MAP ERROR] to 3G_MSC-A
Iu-RELEASE-REQUEST from RNS-A
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
to 3G_MSC-A and VLR-B
Cancel MAP Procedures
to VLR-B
Cancel MAP Procedures
Release Resources in RNS-A
UE on 3G_MSC-B (UTRAN)
IDLE


Procedures for Handover in 3G_MSC-B
Wait for Connect from 3G_MSC-A (SRNS Relocation)
I_CONNECT (IAM) from 3G_MSC-A (Uses Handover No.)
Expiry T810
Iu-RELEASE-REQUEST from RNS-A
Reset T810
to 3G_MSC-A in 3G_MSC-B
Cancel MAP Procedures
MAP-PAS req. [IU-IREL-REQUEST] to 3G_MSC-A
MAP-SEND-HANDOVER-REPORT resp. to VLR-B
Cancel MAP Procedures
to 3G_MSC-A in 3G_MSC-B
I_COMPLETE (ACM) to 3G_MSC-A
Release Radio Resources on RNS-A
Call on 3G_MSC-B (UTRAN)
IDLE

Procedure 3G_MSC_B_HO



3GPP/SMG Meeting TSG-CN-WG1 #12
Oahu/Hawaii, USA, 22-26 May, 2000

Document ***N1-000619***

CHANGE REQUEST

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24.007	**CR**	**012**	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG CN#8	for approval	X	strategic		*(for SMG use only)*
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: Ericsson **Date:** 09/05/00

Subject: Remove GRR primitive descriptions and make reference to other document

Work item: GSM - UMTS Interworking

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

The CR removes detailed description of the GRR primitives and refers to 04.64 instead which contains the more reliable description. (Some inconsistencies currently exist in 24.007) Avoiding duplication of primitive descriptions in separate documents also means less maintenance work in 24.007. In addition, incorrect reference to 24.060 is removed from 24.007.

Clauses affected: 9.3, 9.3.1, 10.3, 10.3.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

9.3 Services provided by radio resource management entity for GPRS services

~~This subclause is informative, the service primitives are defined in TS 24.060 [10]. They are included here to provide a complete overview of the radio interface protocol architecture.~~

9.3.1 Service primitives for GRR-SAP

The GRR-SAP service primitives are defined in GSM 04.64 [11a]

~~Table 9.3.1: Primitives and parameters at GRR-SAP~~

~~PRIMITIVE~~	~~PARAMETER (message, info elements of message, other parameters)~~	~~REFERENCE~~
~~GRR-DATA-REQ~~	~~LLC PDU, Priority, Cause~~	~~9.3.1.1~~
~~GRR-DATA-IND~~	~~LLC PDU~~	~~9.3.1.2~~
~~GRR-UNITDATA-REQ~~	~~LLC PDU, Priority~~	~~9.3.1.3~~
~~GRR-UNITDATA-IND~~	~~LLC PDU~~	~~9.3.1.4~~
~~GRR-STATUS-IND~~	~~cause~~	~~9.3.1.5~~

~~9.3.1.1 GRR-DATA-REQ~~

~~Request used by the LL sublayer for acknowledged data transmission with a certain priority. Cause indicates if the GRR-DATA-REQ was triggered as an implicit page response.~~

~~9.3.1.2 GRR-DATA-IND~~

~~Indication used by RR to transfer received data to the LL sublayer.~~

~~9.3.1.3 GRR-UNITDATA-REQ~~

~~Request used by the LL sublayer for unacknowledged data transmission with a certain priority.~~

~~9.3.1.4 GRR-UNITDATA-IND~~

~~Indication used by RR to transfer received data to the LL sublayer.~~

~~9.3.1.5 GRR-STATUS-IND~~

~~Indication used by RR to transfer RLC/MAC failures to the LL sublayer.~~

Next Modified Section

10.3 Services provided by radio resource management entity for GPRS services

This section is informative, the service primitives are defined in TS 24.060 [10]. They are included here to provide a complete overview of the radio interface protocol architecture.

10.3.1 Service primitives for GRR-SAP

The GRR-SAP service primitives are defined in GSM 04.64 [11a]

Table 10.3.1 Primitives and Parameters at GRR-SAP - network side

PRIMITIVE	PARAMETER (message, info elements of message, other parameters)	REFERENCE
GRR-DATA-REQ	LLC PDU, TLLI, CI, DRX, MS CLM, QoS, Priority	10.3.1.1
GRR-DATA-IND	LLC PDU, TLLI, CI	10.3.1.2
GRR-UNITDATA-REQ	LLC PDU, TLLI, CI, DRX, MS CLM, QoS, Priority	10.3.1.3
GRR-UNITDATA-IND	LLC PDU, TLLI, CI	10.3.1.4
GRR-STATUS-IND	TLLI, cause	10.3.1.5

10.3.1.1 GRR-DATA-REQ

Request used by the LLC layer for acknowledged data transmission with a certain priority.

10.3.1.2 GRR-DATA-IND

Indication used by RR to transfer received data, which shall be acknowledged, to the LLC layer.

10.3.1.3 GRR-UNITDATA-REQ

Request used by the LLC layer for unacknowledged data transmission with a certain priority.

10.3.1.4 GRR-UNITDATA-IND

Indication used by RR to transfer received data, which shall not be acknowledged, to the LLC layer

10.3.1.5 GRR-STATUS-IND

Indication to upper layers that an error has occurred on the radio interface. The cause for the failure is indicated

3GPP CN1/SMG£WPA Meeting #12
Oahu/Hawaii, USA, 22-26 May, 2000

Document *N1-000620*
Revision of N1-000390
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

24.007	CR	006 R2	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSGN#8 *list expected approval meeting # here ↑*

for approval	X	strategic	
for information		non-strategic	

(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*

(U)SIM	ME	UTRAN / Radio	Core Network
	X		X

Source: Ericsson **Date:** 08/05/00

Subject: Updating SM for R99

Work item: GSM/UMTS Interworking

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: The CR updates 24.007 in accordance with the updates made to 24.008 for GPRS/UMTS SM for R99.
It also makes some editorial corrections to faults found in 24.007 for SM.

Clauses affected: 6.5.1

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

<--------- double-click here for help and instructions on how to create a CR.

6.5 Session Management Services for GPRS-Services

Session Management services are provided at the SMREG-SAP and the SNSM-SAP. The procedures for PDP context activation and PDP context deactivation are available at the SMREG-SAP. In addition there exists a PDP context modification.

Before any user data transfer is initiated (eg.via SNDCP in GSM case), the PDP context activation procedure must be performed.

6.5.1 Session Management Services for SMREG-SAP

Table 6.5: Primitives and Parameters at SMREG-SAP - MS side

PRIMITIVE	PARAMETER (message, info elements of message, other parameters)	REFERENCE
SMREG-PDP-ACTIVATE-REQ	PDP address, QoS, NSAPI, APN, Protocol configuration options	6.5.1.1
SMREG-PDP-ACTIVATE-CNF	PDP address, QoS, NSAPI, Protocol configuration options	6.5.1.2
SMREG-PDP-ACTIVATE-REJ	Cause, NSAPI, Protocol configuration options	6.5.1.3
SMREG-PDP-ACTIVATE-IND	PDP address, APN	6.5.1.4
SMREG-PDP-ACTIVATE-REJ-RSP	Cause, PDP address, APN	6.5.1.~~14~~9
SMREG-PDP-DEACTIVATE-REQ	NSAPI(s) tear down indicator, cause	6.5.1.5
SMREG-PDP-DEACTIVATE-CNF	NSAPI(s)	6.5.1.6
SMREG-PDP-DEACTIVATE-IND	NSAPI(s) (s), tear down indicator, cause	6.5.1.7
SMREG-PDP-MODIFY-IND	QoS, NSAPI	6.5.1.8
SMREG-PDP-MODIFY-REQ	QoS, NSAPI, TFT	6.5.1.~~18~~13
SMREG-PDP-MODIFY-CNF	QoS, NSAPI	6.5.1.~~19~~14
SMREG-PDP-MODIFY-REJ	Cause, NSAPI	6.5.1.~~20~~15
SMREG-PDP-ACTIVATE-SEC-REQ	QoS, NSAPI, TFT, Primary NSAPI	6.5.1.~~15~~10
SMREG-PDP-ACTIVATE-SEC-CNF	QoS, NSAPI	6.5.1.~~16~~11
SMREG-PDP-ACTIVATE-SEC-REJ	Cause, NSAPI	6.5.1.~~17~~12

6.5.1.1 SMREG-PDP-ACTIVATE-REQ

The MS initiates a primary PDP context activation. SM is requested to send the ACTIVATE PDP CONTEXT REQUEST message to the network. The PDP context is pending activation.

6.5.1.2 SMREG-PDP-ACTIVATE-CNF

The MS initiated primary PDP context activation succeeded. The network confirmed the PDP context activation, i.e. the ACTIVATE PDP CONTEXT ACCEPT message was received from the network. In GSM, this implies that SM has ordered SNDCP to establish the needed LLC link. In the UMTS case, this implies that the RLC link towards the RNC has been established and that the SM has been informed about this from the RABM service entity in the MS. (RABM-RAB Management service entity is FFS and could lead to update of the protocol architecture in figure 5.2 and 5.3) The PDP context is active.

6.5.1.3 SMREG-PDP-ACTIVATE-REJ

The PDP primary context activation failed, the PDP context is not activated. One reason for failure is that the network rejected the activation attempt, which means the ACTIVATE PDP CONTEXT REJECT message was received. Another reason is e.g. that it was not possible to establish the needed LLC link in the GSM case.

6.5.1.4 SMREG-PDP-ACTIVATE-IND

The network asked for a PDP context activation. The REQUEST PDP CONTEXT ACTIVATION message was received from the network. The MS reacts either by initiating a new primary PDP context activation or by rejecting the network's request.

6.5.1.5 SMREG-PDP-DEACTIVATE-REQ

The MS initiates a PDP context deactivation: SM is requested to send a DEACTIVATE PDP CONTEXT REQUEST message to the network. The PDP context is pending deactivation. Presence of the teardown indicator will lead to deactivation of all PDP contexts coupled to the identified PDP address. NSAPI(s) to be deallocated from the SNDCP entity via the SNSM-SAP for the GSM case, are included in the primitive.

6.5.1.6 SMREG-PDP-DEACTIVATE-CNF

The MS initiated PDP context deactivation has been done. The network confirmed the PDP context deactivation, i.e. the DEACTIVATE PDP CONTEXT ACCEPT message was received from the network. For GSM SM has ordered SNDCP to locally release not further needed LLC links. In the UMTS case, the release of the RLC link towards the RNC takes place as a result of a RAB release trigger from the network side. SM has been informed about this from the RABM service entity in the MS. (RABM- RAB Management service entity is FFS and could lead to update of the protocol architecture in figure 5.2 and 5.3) The PDP context has been deactivated.

6.5.1.7 SMREG-PDP-DEACTIVATE-IND

A network initiated PDP context deactivation has been performed. The DEACTIVATE PDP CONTEXT REQUEST message has been received from the network. The MS has acknowledged with the DEACIVATE PDP CONTEXT ACCEPT message. The PDP context has been deactivated, Not further needed LLC links were locally released. Presence of the teardown indicator will lead to deactivation of all PDP contexts coupled to the identified PDP address. NSAPI is included in the primitive to allow identification of the PDP context(s) needing deactivation.

6.5.1.8 SMREG-PDP-MODIFY-IND

A network initiated PDP context modification has been performed. The MODIFY PDP CONTEXT REQUEST message has been received from the network. The modification has been acknowledged by sending the MODIFY PDP CONTEXT ACCEPT message. One PDP context has been modified. LLC links is adjusted.

~~6.5.1.9 VOID~~

~~6.5.1.10 VOID~~

~~6.5.1.11 VOID~~

~~6.5.1.12 VOID~~

~~6.5.1.13 VOID~~

6.5.1.~~14~~9 SMREG-PDP-ACTIVATE-REJ-RSP

The network requested PDP context activation failed.

6.5.1.~~15~~10 SMREG-PDP-ACTIVATE-SEC-REQ

The MS initiates a secondary PDP context activation. SM is requested to send the ACTIVATE SECONDARY PDP CONTEXT REQUEST message to the network. The PDP context is pending activation.

6.5.1.~~16~~11 SMREG-PDP-ACTIVATE-SEC-CNF

The MS initiated secondary PDP context activation succeeded. The network confirmed the PDP context activation, i.e. the ACTIVATE SECONDARY PDP CONTEXT ACCEPT message was received from the network. In GSM, this implies that SM has ordered SNDCP to establish the needed LLC link. In the UMTS case, this implies that the RLC link towards the RNC has been established and that the SM has been informed about this from the RABM service entity in the MS. (RABM- RAB Management service entity is FFS and could lead to update of the protocol architecture in figure 5.2 and 5.3) The PDP context connected to the same PDP address as the PDP context identified by the ~~linked~~ primary NSAPI parameter in SMREG-PDP-ACTIVATE-SEC-REQ is active. ('Primary NSAPI' will point to any one of the other established PDP contexts for a given PDP address).

6.5.1.~~17~~12 SMREG-PDP-ACTIVATE-SEC-REJ

The secondary PDP context activation failed, the PDP context is not activated. One reason for failure is that the network rejected the activation attempt, which means the ACTIVATE SECONDARY PDP CONTEXT REJECT message was received. Another reason is e.g. that it was not possible to establish the needed LLC link in the GSM case.

6.5.1.~~18~~13 SMREG-PDP-MODIFY-REQ

An MS initiated PDP context modification is requested. The MODIFY PDP CONTEXT REQUEST message is sent to the network and pending acceptance. Affected PDP context is identified via the NSAPI value included in the primitive.

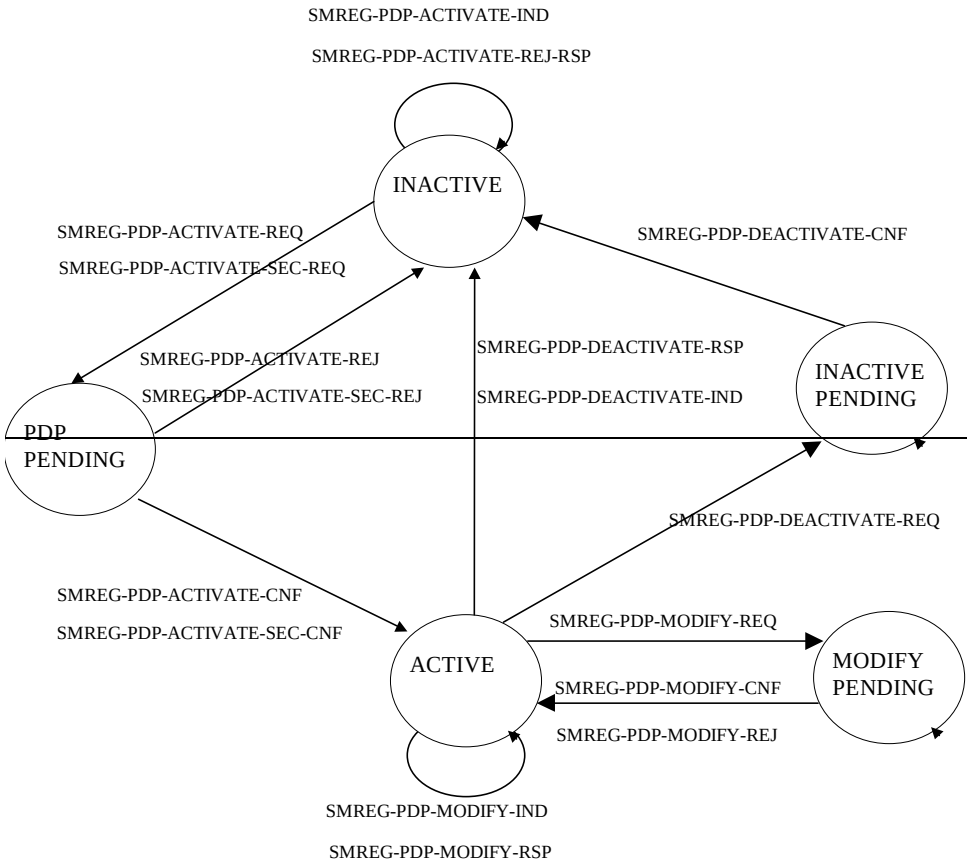
6.5.1.~~19~~14 SMREG-PDP-MODIFY-CNF

An MS initiated PDP context modification has been accepted by the network. The modification is acknowledged from the network via the MODIFY PDP CONTEXT ACCEPT message. The addressed PDP context has been modified. LLC or RLC link is adjusted according to the QoS returned from the network.

6.5.1.~~20~~15 SMREG-PDP-MODIFY-REJ

An MS initiated PDP context modification has been rejected by the network. The rejection is signalled from the network via the MODIFY PDP CONTEXT REJECT message with the cause code. The PDP context remains active without change of QoS.

The session management services provided at the service access point SMREG-SAP are illustrated in the state machines of figure 6.4 ~~and 6.5~~ below. Note, that the state machine describes only one PDP context within the SM entity.



~~Figure 6.4: Session Management service states at the SMREG-SAP for GPRS PDP context handling - MS side~~

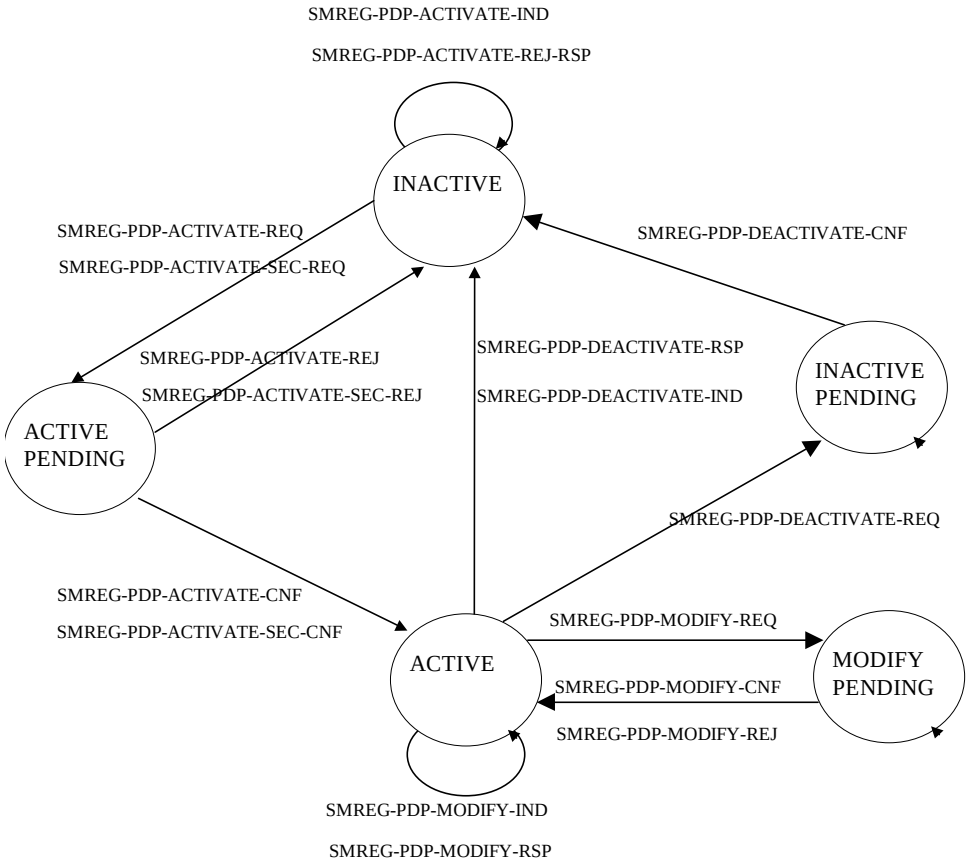


Figure 6.4: Session Management service states at the SMREG-SAP for GPRS PDP context handling - MS side

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Hawaii, USA, 22-26 May 2000

Document N1-000643

CHANGE REQUEST

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24.008	CR	203	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG CN#8	For approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source:	Ericsson **Date:** 2000-05-09
Subject:	Editorial corrections to MM and GMM in 24.008
Work item:	GSM-UMTS Interworking

Category: *(only one category shall be marked with an X)*			**Release:**	
F	Correction	X	Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature		Release 98	
D	Editorial modification		Release 99	X
			Release 00	

Reason for change:

This CR proposes the following editorial corrections:

- Correct the naming of the UMTS GPRS integrity key and the GPRS ciphering key sequence number in chapter 4.1.3.2 “GPRS update status”
- Move chapter 4.3.2.9 “Use of established security contexts” to chapter 4.3.2.7, to align the MM description with the GMM description in 24.008.
- Chapter 4.4.5 “Core Network System Information (UMTS only)“ for MM and chapter 4.7.14 “Core Network System Information (UMTS only)” for GMM are moved from chapter 4.4 “MM specific procedures” to sub-chapters 4.1.1.3 and 4.1.1.3 in chapter 4.1.1 “MM and GMM procedures”
- Chapter 4.4.6 “Paging response in UMTS” is moved from chapter 4.4 “MM specific procedures” to sub-chapter 4.5.1.3.3 in chapter 4.5.1.3 “MM connection establishment initiated by the network”.

Notice that the actual content in the moved chapters have not been changed.

Clauses affected: 4.1.1.3 (new), 4.1.1.4 (new), 4.1.3.2, 4.3.2.7, 4.3.2.8, 4.3.2.9, 4.7.14 (deleted), 4.4.5 (deleted), 4.4.6 (deleted), 4.5.1.3.3 (new)

Other specs affected:			
Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

4.1.3.2 GPRS update status

In addition to the GMM sublayer states described so far, a GPRS update status exists.

The GPRS update status pertains to a specific subscriber embodied by a SIM. This status is defined even when the subscriber is not activated (SIM removed or connected to a switched off ME). It is stored in a non volatile memory in the SIM. The GPRS update status is changed only after execution of a GPRS attach, network initiated GPRS detach, authentication procedure, or routing area updating procedure.

GU1: UPDATED

The last GPRS attach or routing area updating attempt was successful (correct procedure outcome, and the answer was accepted by the network). The SIM contains the RAI of the routing area (RA) to which the subscriber was attached, and possibly a valid P-TMSI, GPRS GSM ciphering key, GPRS UMTS ciphering key, GPRS UMTS integrity key and GPRS ~~UMTS~~ ciphering key sequence number.

GU2: NOT UPDATED

The last GPRS attach or routing area updating attempt failed procedurally, i.e. no response was received from the network. This includes the cases of failures or congestion inside the network.

In this case, the SIM may contain the RAI of the routing area (RA) to which the subscriber was attached, and possibly also a valid P-TMSI, GPRS GSM ciphering key, GPRS UMTS ciphering key, GPRS UMTS integrity key and GPRS ciphering key sequence number. For compatibility reasons, all these fields shall be set to the "deleted" value if the RAI is deleted. However, the presence of other values shall not be considered an error by the MS.

GU3: ROAMING NOT ALLOWED

The last GPRS attach or routing area updating attempt was correctly performed, but the answer from the network was negative (because of roaming or subscription restrictions).

For this status, the SIM does not contain any valid RAI, P-TMSI, GPRS GSM ciphering key, GPRS UMTS ciphering key, GPRS UMTS integrity key or GPRS ciphering key sequence number. For compatibility reasons, all these fields must be set to the value "deleted" at the moment the status is set to ROAMING NOT ALLOWED. However, the presence of other values shall not be considered an error by the MS.

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

4.3.2.7 Use of established security contexts

In GSM, in the case of an established GSM security context, the GSM ciphering key shall be taken into use by the ME when any valid CIPHERING MODE COMMAND is received during an RR connection (the definition of a valid CIPHERING MODE COMMAND message is given in GSM 04.18 section 3.4.7.2).

In GSM, in the case of an established UMTS security context, the GSM ciphering key shall be taken into use by the MS when a valid CIPHERING MODE COMMAND is received during an RR connection (the definition of a valid CIPHERING MODE COMMAND message is given in GSM 04.18 section 3.4.7.2). The network shall derive a GSM ciphering key from the UMTS ciphering key and the UMTS integrity key by using the conversion function named "c3" defined in TS 33.102.

In UMTS, in the case of an established GSM security context, the ME shall derive a UMTS ciphering key and a UMTS integrity key from the GSM ciphering key by using the conversion functions named "c4" and "c5" defined in TS 33.102. The derived UMTS ciphering key and UMTS integrity key shall be taken into use by the MS when a valid SECURITY MODE COMMAND indicating CS domain is received during an RR connection (the definition of a valid SECURITY MODE COMMAND message is given in TS 25.331). The network shall derive a UMTS ciphering key and a UMTS integrity key from the GSM ciphering key by using the conversion functions named "c4" and "c5" defined in TS 33.102.

In UMTS, in the case of an established UMTS security context, the UMTS ciphering key and UMTS integrity key shall be taken into use by the MS when a valid SECURITY MODE COMMAND indicating CS domain is received during a RR connection (the definition of a valid SECURITY MODE COMMAND message is given in TS 25.331).

NOTE: In UMTS and GSM, during an ongoing, already ciphering and/or integrity protected RR connection, the network might initiate a new Authentication procedure in order to establish a new GSM/UMTS security context. The new keys are taken into use in the MS when a new valid SECURITY MODE COMMAND indicating CS domain in UMTS, or a new valid CIPHERING MODE COMMAND in GSM, is received during the RR connection.

4.3.2.~~7~~8 Handling of keys at intersystem change from UMTS to GSM

At intersystem change from UMTS to GSM, ciphering may be started (see GSM 04.18) without any new authentication procedure. Deduction of the appropriate security key for ciphering in GSM, depends on the current GSM/UMTS security context stored in the MS and the network.

The ME shall handle the GSM ciphering key according to Table 4.3.2.~~7~~8.1.

Table 4.3.2.~~7~~8.1/TS 24.008: Intersystem change from UMTS to GSM

Security context established in MS and network in UMTS	At intersystem change to GSM:
GSM security context	An ME shall apply the GSM cipher key received from the GSM security context residing in the SIM.
UMTS security context	An ME shall apply the GSM cipher key derived by the SIM from the UMTS cipher key and the UMTS integrity key.

NOTE A SIM with UMTS security context, passes the UMTS cipher key, the UMTS integrity key and the derived GSM cipher key to the ME independent on the current radio access being UMTS or GSM.

4.3.2.~~8~~9 Handling of keys at intersystem change from GSM to UMTS

At intersystem change from UMTS to GSM, ciphering and integrity may be started (see TS 25.331) without any new authentication procedure. Deduction of the appropriate security keys for ciphering and integrity check in UMTS, depend on the current GSM/UMTS security context stored in the MS and the network.

The ME shall handle the UMTS cipher key and the UMTS integrity key according to Table 4.3.2.~~8~~9.1.

Table 4.3.2.~~8~~9.1/TS 24.008: Intersystem change from GSM to UMTS

Security context established in MS and network in GSM	At intersystem change to UMTS:
GSM security context	An ME shall derive the UMTS cipher key and UMTS integrity key from the GSM cipher key provided by the SIM. The conversion functions named “c4” and “c5” in TS 33.102 are used for this purpose.
UMTS security context	An ME shall apply the UMTS ciphering key and the UMTS integrity key received from the UMTS security context residing in the SIM.

NOTE A SIM with UMTS security context, passes the UMTS cipher key, the UMTS integrity key and the derived GSM cipher key to the ME independent on the current radio access being UMTS or GSM.

~~4.3.2.9 Use of established security contexts~~

~~In GSM, in the case of an established GSM security context, the GSM ciphering key shall be taken into use by the ME when any valid CIPHERING MODE COMMAND is received during an RR connection (the definition of a valid CIPHERING MODE COMMAND message is given in GSM 04.18 section 3.4.7.2).~~

~~In GSM, in the case of an established UMTS security context, the GSM ciphering key shall be taken into use by the MS when a valid CIPHERING MODE COMMAND is received during an RR connection (the definition of a valid CIPHERING MODE COMMAND message is given in GSM 04.18 section 3.4.7.2). The network shall derive a GSM ciphering key from the UMTS ciphering key and the UMTS integrity key by using the conversion function named “c3” defined in TS 33.102.~~

~~In UMTS, in the case of an established GSM security context, the ME shall derive a UMTS ciphering key and a UMTS integrity key from the GSM ciphering key by using the conversion functions named “c4” and “c5” defined in TS~~

~~33.102. The derived UMTS ciphering key and UMTS integrity key shall be taken into use by the MS when a valid SECURITY MODE COMMAND indicating CS domain is received during an RR connection (the definition of a valid SECURITY MODE COMMAND message is given in TS 25.331). The network shall derive a UMTS ciphering key and a UMTS integrity key from the GSM ciphering key by using the conversion functions named "c4" and "c5" defined in TS 33.102.~~

~~In UMTS, in the case of an established UMTS security context, the UMTS ciphering key and UMTS integrity key shall be taken into use by the MS when a valid SECURITY MODE COMMAND indicating CS domain is received during a RR connection (the definition of a valid SECURITY MODE COMMAND message is given in TS 25.331).~~

~~NOTE: In UMTS and GSM, during an ongoing, already ciphering and/or integrity protected RR connection, the network might initiate a new Authentication procedure in order to establish a new GSM/UMTS security context. The new keys are taken into use in the MS when a new valid SECURITY MODE COMMAND indicating CS domain in UMTS, or a new valid CIPHERING MODE COMMAND in GSM, is received during the RR connection.~~

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

4.1.1 MM and GMM procedures

4.1.1.1 Types of MM and GMM procedures

4.1.1.2 MM-GMM co-ordination for GPRS MS's

4.1.1.2.1 GPRS MS operating in mode A or B in a network that operates in mode I

4.1.1.2.2 GPRS MS operating in mode A or B in a network that operates in mode II or III

4.1.1.3 Core Network System Information for MM (UMTS only)

In the network broadcast system information some of the system information is used by MM.

At reception of new system information, the RRC layer in the MS delivers the contents of the CN common system information and the CS domain specific system information to the MM layer in the MS.

The Core Network system information is included in specific information elements within some RRC messages sent to MS, see TS 25.331. In the Core Network system information the Common system information part and the CS domain specific system information part contains settings of parameters controlling MM functionality. No MM messages contain the Core Network System Information.

4.1.1.4 Core Network System Information for GMM (UMTS only)

In the network broadcast system information some of the system information is used by GMM.

At reception of new system information, the RRC layer in the MS delivers the contents of the CN common system information and the PS domain specific system information to the GMM layer in the MS.

The Core Network system information is included in specific information elements within some RRC messages sent to MS, see TS 25.331. In the Core Network system information the Common system information part and the PS domain specific system information part contains settings of parameters controlling GMM functionality. No GMM messages contain the Core Network System Information.

4.4 MM specific procedures

4.4.1 Location updating procedure

4.4.2 Periodic updating

4.4.3 IMSI attach procedure

4.4.4 Generic Location Updating procedure

~~4.4.5 Core Network System Information (UMTS only)~~

~~In the network broadcast system information some of the system information is used by MM.~~

~~At reception of new system information, the RRC layer in the MS delivers the contents of the CN common system information and the CS domain specific system information to the MM layer in the MS.~~

~~The Core Network system information is included in specific information elements within some RRC messages sent to MS, see TS 25.331. In the Core Network system information the Common system information part and the CS domain specific system information part contains settings of parameters controlling MM functionality. No MM messages contain the Core Network System Information.~~

~~4.7.14 Core Network System Information (UMTS only)~~

~~In the network broadcast system information some of the system information is used by GMM.~~

~~At reception of new system information, the RRC layer in the MS delivers the contents of the CN common system information and the PS domain specific system information to the GMM layer in the MS.~~

~~The Core Network system information is included in specific information elements within some RRC messages sent to MS, see TS 25.331. In the Core Network system information the Common system information part and the PS domain specific system information part contains settings of parameters controlling GMM functionality. No GMM messages contain the Core Network System Information.~~

*** Next Modification ***

~~4.4.6 Paging response in UMTS~~

~~The network may initiate the paging procedure for CS services when the MS is IMSI attached for CS services. To initiate the procedure, the MM entity requests the RR sublayer to initiate paging (see TS 25.331 and TS 25.413) for CS services.~~

~~At reception of a paging message, the RR sublayer in the MS shall deliver a paging indication to the MM sublayer if the paging was initiated by the MM entity in the network (see TS 25.331). The MS shall respond with the PAGING RESPONSE message defined in GSM 04.18, chapter 9.1.25. For reasons of backward compatibility the paging response shall use the RR protocol discriminator.~~

4.5.1.3 MM connection establishment initiated by the network

4.5.1.3.1 Mobile Terminating CM Activity

4.5.1.3.2 Mobile Originating CM Activity $(CCBS)$

4.5.1.3.3 Paging response in UMTS (UMTS only)

The network may initiate the paging procedure for CS services when the MS is IMSI attached for CS services. To initiate the procedure, the MM entity requests the RR sublayer to initiate paging (see TS 25.331 and TS 25.413) for CS services.

At reception of a paging message, the RR sublayer in the MS shall deliver a paging indication to the MM sublayer if the paging was initiated by the MM entity in the network (see TS 25.331). The MS shall respond with the PAGING RESPONSE message defined in GSM 04.18, chapter 9.1.25. For reasons of backward compatibility the paging response shall use the RR protocol discriminator.

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e.g. for 3GPP use the format TP-99xxx
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24.007	CR	016	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	CN #8	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	

Source: Motorola **Date:** May 22, 2000

Subject: Proposed CR on "Services provided by the Radio Resource Management entity"

Work item: GSM- UMTS interworking

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The routing of upper layer PDUs is the function of the RRC layer. In TS 25.331 (Radio Resource Control) there is a requirement for the upper layers to indicate to RRC the initiation of a new signalling session (connection) in order to make a decision to send either the "Initial Direct Transfer" message or the "Uplink Direct Transfer" message to carry L3 messages. In TS 24.007 v 3.3.1 this information is missing. This CR proposes to provide this indication through new primitives, RR_INIT_REQ, RR_INIT_CONF and RR_FREL_REQ, and information carried in the RR_DATA_REQ primitive. In addition it is required to indicate the protocol discriminator and CN Domain identity to the RRC layer so that they can be included in the RRC information elements of the Initial Direct Transfer message.

Clauses affected: 9.1.2, 9.1.2.5, 9.1.2.6, 9.1.2.X

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

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9 Interlayer service interfaces on the MS side

In addition to the services described in this clause, the RR entity and MM entity also provide services to CM entities which don't belong to the functional blocks of CC, SMS, and SS. (For example, the RR entity provides service to Group Call and Broadcast Call entities.) These services are not further described in this clause.

9.1 Services provided by the Radio Resource Management entity

The Radio Resource Management (RR) sublayer provides a service to the Mobility Management entity (MM).

The RR services are used for:

- establishing control channel connections;
- releasing control channel connections;
- control-data transfer.

The Radio Resource Management services are represented by the RR-service primitives.

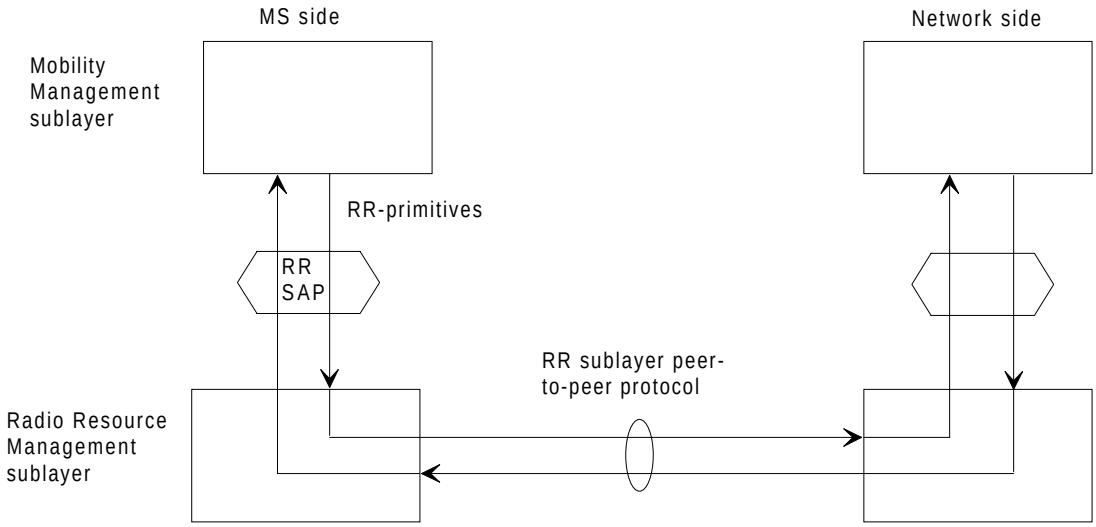

Figure 9.1: Services provided at RR-SAP - MS side

9.1.1 Service state diagram

The primitives provided by the Radio Resource Management entity and the transition between permitted states are shown in figure 9.2.

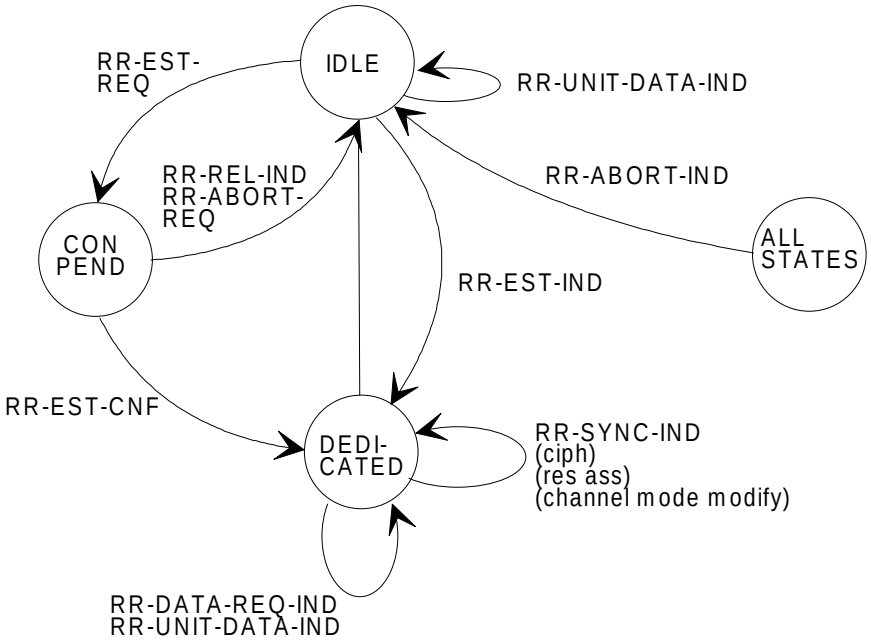

Figure 9.2: Service graph of the Radio Resource Management - MS side

9.1.2 Service primitives

Table 9.1: Primitives and parameters at the RR-SAP - MS side

PRIMITIVES	PARAMETERS	REFERENCE
RR_EST_REQ	Layer 3 message transferred in the SABM frame	9.1.2.1
RR_EST_IND	-	9.1.2.2
RR_EST_CNF	-	9.1.2.3
RR_REL_IND	cause	9.1.2.4
RR_SYNC_IND	cause (ciphering, res. ass., channel mode modify)	9.1.2.5
RR_DATA_REQ	Layer 3 message, local flow identifier	9.1.2.6
RR_DATA_IND	Layer 3 message	9.1.2.7
RR_UNIT DATA_IND	Layer 3 message	9.1.2.8
RR_ABORT_REQ	cause	9.1.2.9
RR_ABORT_IND	cause	9.1.2.10
RR_ACT_REQ	reselection mode	9.1.2.11
RR_INIT_REQ	Initial L3 message, CN Domain identity, Protocol Discriminator	9.1.2.X
RR_INIT_CONF	Local Flow identifier	9.1.2.Y
RR_FREL_REQ	Local flow identifier	9.1.2.Z

9.1.2.1 RR_EST_REQ

Is used by the Mobility Management entity to request establishment of a Mobile originated RR connection. The request shall be given only in the IDLE state when the MS listens to the CCCH and the previously selected BCCH.

9.1.2.2 RR_EST_IND

Indicates to the Mobility Management entity the establishment of a Mobile terminated RR connection. By this indication MM is informed that a transparent connection exists and RR is in the dedicated mode.

9.1.2.3 RR_EST_CNF

Is used by RR to indicate the successful completion of a Mobile originated RR connection establishment. RR connection exists and RR is in the dedicated mode.

9.1.2.4 RR_REL_IND

Is used by RR to indicate to the Mobility Management entity the release of a RR connection when RR has received a CHANNEL RELEASE from the Network and has triggered a normal release of the data link layer. It is also used to indicate that a requested RR connection cannot be established. In both cases, RR returns to IDLE mode.

9.1.2.5 RR_SYNC_IND

Is used for synchronizing RR and the Mobility Management entity after the establishment of a Mobile originated or Mobile terminated RR connection. This indication is provided to MM in the following cases:

- ciphering has been started (ciphering);
- integrity protection has been started (integrity) (UMTS only);
- a traffic channel has been assigned (res. ass. = "resource assigned");
- the channel mode has been modified (channel mode modify).

9.1.2.X RR_INIT_REQ

For UMTS, it is used by the Mobility Management entity to request RRC to establish a new signalling flow between the UE and the Core Network via an existing RRC connection. It includes:

- the Protocol Discriminator and CN Domain Identity requested in the L3 (control data) message;
- an associated L3 message.

The primitive is invoked for every new PD/TI upper layer transaction.

9.1.2.Y RR_INIT_CONF

For UMTS, it is used by the RRC entity to inform the MM entity of the "local flow identifier" allocated to the requested signalling flow through the RR_INIT_REQ primitive.

9.1.2.6 RR_DATA_REQ

Is used by the Mobility Management entity to send control data to its peer entity on the Network side via an existing RR connection.

For UMTS, RR_DATA_REQ is used to send all subsequent control data (L3) messages belonging to an on-going signalling flow. It includes:

- associated L3 message,
- the "local flow identifier" allocated by the RRC entity, identifying the signalling flow the control data message belongs to.

9.1.2.7 RR_DATA_IND

Is used by RR to indicate control-data, which has been received from its peer entity on the Network side via an existing RR connection.

For UMTS, RR_DATA_IND is also used to indicate whether control-data has been:

- successfully integrity checked;
- unsuccessfully integrity checked;
- received with no integrity protection.

9.1.2.Z RR_FREL_REQ

For UMTS, it is used by MM to inform RRC that it can release a local flow identifier and the corresponding signalling flow.

This primitive is invoked by MM when the corresponding signalling flow is released by upper layers.

9.1.2.8 RR_UNIT_DATA_IND

Is used by RR to provide MM with system info. The system info is received on the current BCCH if RR is in the IDLE state. If a RR connection has been established, the system info is received on the SACCH.

9.1.2.9 RR_ABORT_REQ

Request to abort an existing RR connection or a RR connection in progress. The data link, if already established, shall be released by a normal release procedure (DISC/UA) initiated by the MS. This is the only way the MS can trigger the release of a RR connection in case of exceptional conditions. The RR returns to the IDLE state.

9.1.2.10 RR_ABORT_IND

Indication that the RR connection has been aborted by a lower layer failure and RR has returned to the IDLE state.

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24.008	CR	215	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: Siemens AG **Date:** 17.05.2000

Subject: Correction of references in protocol error handling for SM

Work item: GSM/UMTS interworking

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: CR 24.008–111 removed the Anonymous Access from TS 24.008. The references in subclause 8.5 have to be adapted accordingly.

Clauses affected: 8.5

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

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8.5 Non-semantical mandatory information element errors

When on receipt of a message,

- an "imperative message part" error; or
- a "missing mandatory IE" error

is diagnosed or when a message containing:

- a syntactically incorrect mandatory IE; or
- an IE unknown in the message, but encoded as "comprehension required" (see GSM 04.07); or
- an out of sequence IE encoded as "comprehension required" (see section 04.07)

is received,

- the mobile station shall proceed as follows:

  If the message is not one of the messages listed in sections 8.5.1, 8.5.2, 8.5.3, 8.5.4 and 8.5.5 a)~~, b)~~ or bc~~)~~), the mobile station shall ignore the message except for the fact that, if an RR connection exists, it shall return a status message (STATUS, MM STATUS depending on the protocol discriminator) with cause # 96 "Invalid mandatory information". If the message was a GMM message the GMM-STATUS message with cause #96 " Invalid mandatory information" shall be returned. If the message was an SM message the SM-STATUS message with cause # 96 "invalid mandatory information" shall be returned.

- the network shall proceed as follows:

  When the message is not one of the messages listed in section 8.5.3 b), c), d) or e) and 8.5.5 a)~~, b), d)~~ or ce), the network shall either:

  - try to treat the message (the exact further actions are implementation dependent), or
  - ignore the message except that it should return a status message (STATUS, or MM STATUS (depending on the protocol discriminator), GMM STATUS, or SM STATUS) with cause # 96 "Invalid mandatory information".

********** FOR INFORMATION **********

8.5.5 Session management

a) If the message is a DEACTIVATE PDP CONTEXT REQUEST, a DEACTIVATE PDP CONTEXT ACCEPT message shall be returned. All resources allocated for that context shall be released.

b) If the message is a REQUEST PDP CONTEXT ACTIVATION, a REQUEST PDP CONTEXT REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

c) If the message is an ACTIVATE PDP CONTEXT REQUEST, an ACTIVATE PDP CONTEXT REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

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Tdoc N1-000578

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Document N1-000697
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CHANGE REQUEST

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24.008	CR	184r1	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: Vodafone AirTouch **Date:** 22-05-2000

Subject: Introduction of 3G MS capabilities in MS Classmark 3.

Work item: GSM-UMTS Interworking

Category: *(only one category shall be marked with an X)*				**Release:**	
F	Correction			Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The Network needs to know which 3G RAT are supported by the MS, if any, in order to include the appropriate information on 3G Neighbour Cell Description in the Enhanced Measurement Information Message.

Clauses affected: Figure 10.5.7 and Table 10.5.7 in sub-clause 10.5.1.7.

Other specs affected:			
Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: Note that the UMTS “UE Capability Information IE” is not included in the RR Classmark Change message, but sent in a subsequent one. The BSC needs to know if the MS supports a non-GSM RAT as soon as possible, in order to send the non-GSM (downlink) message including 3G Neighbour Cell Description and the MS to start reporting on non-GSM cells. This requires that the RR Classmark Change is *not* segmented. This is possible if the UMTS UE Capability is sent in a subsequent (new) RR message.


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10.5.1.7 Mobile Station Classmark 3

The purpose of the *Mobile Station Classmark 3* information element is to provide the network with information concerning aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station. The Mobile Station Classmark information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS Classmark 3* is a type 4 information element with a maximum of 14 octets length.

The value part of a *MS Classmark 3* information element is coded as shown in figure 10.5.7/TS 24.008 and table 10.5.7/TS 24.008.

NOTE: The 14 octet limit is so that the CLASSMARK CHANGE message will fit in one layer 2 frame.

SEMANTIC RULE : a multiband mobile station shall provide information about all frequency bands it can support. A single band mobile station shall not indicate the band it supports in the *Multiband Supported*, *GSM 400 Bands Supported*, *GSM 850 Associated Radio Capability* or PCS *1900 Associated Radio Capability* fields in the MS Classmark 3. Due to shared radio frequency channel numbers between DCS 1800 and PCS 1900, the mobile should indicate support for either DCS 1800 band OR PCS 1900 band.

SEMANTIC RULE : a mobile station shall include the MS Measurement Capability field if the *Multi Slot Class* field contains a value of 19 or greater (see GSM 05.02).

Typically, the number of spare bits at the end is the minimum to reach an octet boundary. The receiver may add any number of bits set to "0" at the end of the received string if needed for correct decoding.

<**Classmark 3 Value part**> ::=
<spare bit>
{ <Multiband supported : {000}>
<A5 bits> |
<Multiband supported : { 101 | 110}>
<A5 bits>
<**Associated Radio Capability 2** : bit(4)>
<**Associated Radio Capability 1** : bit(4)> |
<Multiband supported : {001 | 010 | 100 }>
<A5 bits>
<spare bit>(4)
<**Associated Radio Capability 1** : bit(4)> }
{ 0 | 1 <R Support> }
{ 0 | 1 <Multi Slot Capability>}
<**UCS2 treatment**: bit>
<Extended Measurement Capability : bit>
{ 0 | 1 <MS measurement capability> }
{ 0 | 1 <MS Positioning Method Capability> }
{ 0 | 1 <EDGE Multi Slot Capability>}

{0 | 1 <EDGE Struct>}
{ 0 | 1 <GSM 400 Bands Supported : {01 | 10 | 11}>
<**GSM 400 Associated Radio Capability**: bit(4)> }

{0 | 1 <**GSM 850 Associated Radio Capability** : bit(4)>}
{0 | 1 <**PCS 1900 Associated Radio Capability** : bit(4)>}
< UMTS FDD Radio Access Technology Capability : bit>
< UMTS TDD Radio Access Technology Capability : bit>
< CDMA 2000 Radio Access Technology Capability : bit>

<spare bit>;

<A5 bits> ::= <**A5/7** : bit> <**A5/6** : bit> <**A5/5** : bit> <**A5/4** : bit> ;

<R Support>::=
< **R-GSM band Associated Radio Capability** : bit(3)>;

<Multi Slot Capability> ::=
<**Multi Slot Class** : bit(5)> ;

< MS Measurement capability > ::=
< **SMS_VALUE** : bit (4) >
< **SM_VALUE** : bit (4) >;
< MS Positioning Method Capability > ::=
< MS Positioning Method : bit(5)>;

<EDGE Multi Slot Capability> ::=
<EDGE Multi Slot Class : bit(5)>;
<EDGE Struct> : :=
<Modulation Capability : bit>
{ 0 | 1 <**EDGE RF Power Capability 1**: bit(2)>}
{ 0 | 1 <**EDGE RF Power Capability 2**: bit(2)>}

Figure 10.5.7/TS 24.008 *Mobile Station Classmark 3* information element

Table 10.5.7/TS 24.008: *Mobile Station Classmark 3* information element

Multiband Supported (3 bit field)

Band 1 supported (third bit of the field)
0 P-GSM not supported
1 P-GSM supported

Band 2 supported (second bit of the field)
0 E-GSM or R-GSM not supported
1 E-GSM or R-GSM supported

Band 3 supported (first bit of the field)
0 DCS 1800 not supported
1 DCS 1800 supported

The indication of support of P-GSM band or E-GSM or R-GSM band is mutually exclusive.

When the 'Band 2 supported' bit indicates support of E-GSM or R-GSM, the presence of the <R Support> field, see below, indicates if the E-GSM or R-GSM band is supported.

In this version of the protocol, the sender indicates in this field either none, one or two of these 3 bands supported. If only one band is indicated, the receiver shall ignore the Associated Radio Capability 2.

For single band mobile station all bits are set to 0.

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

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

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

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

Associated Radio capability 1 and 2

If either of P-GSM or E-GSM or R-GSM is supported, the radio capability 1 field indicates the radio capability for P-GSM, E-GSM or R-GSM, and the radio capability 2 field indicates the radio capability for DCS1800 if supported, and is spare otherwise.

If none of P-GSM or E-GSM or R-GSM are supported, the radio capability 1 field indicates the radio capability for DCS1800, and the radio capability 2 field is spare.

The radio capability contains the binary coding of the power class associated with the band indicated in multiband support bits (see GSMß05.05).

R Support

In case where the R-GSM band is supported the R-GSM band assciated radio capability field contains the binary coding of the power class associated(see GSMß05.05). A mobile station supporting the R-GSM band shall also when appropriate, see 10.5.1.6, indicate its support in the 'FC' bit in the Mobile Station Classmark 2 information element.

Note: the coding of the power class for P-GSM, E-GSM, R-GSM and DCS 1800 in radio capability 1 and/or 2 is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

(continued...)

Table 10.5.1.7/TS 24.008 (continued): *MS Classmark 3* information element

Multi Slot Class (5 bit field)

In case the MS supports the use of multiple timeslots then the Multi Slot Class field is coded as the binary representation of the multislot class defined in TS GSM 05.02.

UCS2 treatment

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings. If not included, the value 0 shall be assumed by the receiver.

0 the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.

1 the ME has no preference between the use of the default alphabet and the use of UCS2.

Extended Measurement Capability

This bit indicates whether the mobile station supports 'Extended Measurements' or not

0 the MS does not support Extended Measurements

1 the MS supports Extended Measurements

SMS_VALUE (Switch-Measure-Switch) (4 bit field)
The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbour cell power measurement, and the switch from that radio channel to another radio channel.
Bits
4 3 2 1
0 0 0 0 1/4 timeslot (~144 microseconds)
0 0 0 1 2/4 timeslot (~288 microseconds)
0 0 1 0 3/4 timeslot (~433 microseconds)
. . .
1 1 1 1 16/4 timeslot (~2307 microseconds)

SM_VALUE (Switch-Measure) (4 bit field)
The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement.
Bits
4 3 2 1
0 0 0 0 1/4 timeslot (~144 microseconds)
0 0 0 1 2/4 timeslot (~288 microseconds)
0 0 1 0 3/4 timeslot (~433 microseconds)
. . .
1 1 1 1 16/4 timeslot (~2307 microseconds)

MS Positioning Method Capability
This bit indicates whether the MS supports Positioning Method or not for the provision of Location Services.

MS Positioning Method (5 bit field)
This field indicates the Positioning Method(s) supported by the mobile station.
MS assisted E-OTD
Bit 5
0: MS assisted E-OTD not supported
1: MS assisted E-OTD supported

MS based E-OTD

MS based E-OTD
Bit 4
0: MS based E-OTD not supported
1: MS based E-OTD supported

MS assisted GPS
Bit 3
0: MS assisted GPS not supported
1: MS assisted GPS supported

MS based GPS
Bit 2
0: MS based GPS not supported
1: MS based GPS supported

MS conventional GPS
Bit 1
0: conventional GPS not supported
1: conventional GPS supported

EDGE Multi Slot class (5 bit field)

In case the EDGE MS supports the use of multiple timeslots and the number of supported time slots is different from number of time slots supported for GMSK then the EDGE Multi Slot class field is included and is coded as the binary representation of the multislot class defined in TS GSM 05.02.

Modulation Capability

Modulation Capability field indicates the supported modulation scheme by MS in addition to GMSK

0 8-PSK supported for downlink reception only

1 8-PSK supported for uplink transmission and downlink reception

EDGE RF Power Capability 1 (2 bit field)

If 8-PSK is supported for both uplink and downlink, the **EDGE RF Power Capability 1** field indicates the radio capability for GSM900.

The radio capability contains the binary coding of the EDGE power class(see GSMß05.05).

EDGE RF Power Capability 2 (2 bit field)

If 8-PSK is supported for both uplink and downlink, the **EDGE RF Power Capability 2** field indicates the radio capability for DCS1800 or PCS1900 if supported, and is not included otherwise.

The radio capability contains the binary coding of the EDGE power class (see GSM 05.05).

GSM 400 Bands Supported (2 bit field)

Bits
2 1
0 1 GSM 480 supported, GSM 450 not supported
1 0 GSM 450 supported, GSM 480 not supported
1 1 GSM 450 supported, GSM 480 supported

GSM 400 Associated Radio Capability (4 bit field)

If either GSM 450 or GSM 480 or both is supported, the GSM 400 Associated Radio Capability field indicates the radio capability for GSM 450 and/or GSM 480.

The radio capability contains the binary coding of the power class associated with the band indicated in GSM 400 Bands Supported bits (see GSM 05.05).

Note: the coding of the power class for GSM 450 and GSM 480 in GSM 400 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

GSM 850 Associated Radio Capability (4 bit field)

This field indicates whether GSM 850 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the GSM 850 band (see GSM 05.05).

Note: the coding of the power class for GSM 850 in GSM 850 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

PCS 1900 Associated Radio Capability (4 bit field)

This field indicates whether PCS 1900 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the PCS 1900 band (see GSM 05.05).

Note: the coding of the power class for PCS 1900 in PCS 1900 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

UMTS FDD Radio Access Technology Capability (1 bit field)

Bit	
0	UMTS FDD not supported
1	UMTS FDD supported

UMTS TDD Radio Access Technology Capability (1 bit field)

Bit	
0	UMTS TDD not supported
1	UMTS TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit	
0	CDMA2000 not supported
1	CDMA2000 supported

3GPP TSG-CN-WG1, Meeting #12

22-26 May, 2000

Oahu/Hawaii, USA

Tdoc N1-000578

3GPP Meeting TSGN1 #12
Oahu, Hawaii 22-26.05.2000

Document ***N1-000736***
~~***N1-000629***~~

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

24.008	CR	194r1	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSGN #8	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source:	Nokia			**Date:**	25.05.2000	
Subject:	Clarifications on GSM-UMTS interoperability					
Work item:	GSM – UMTS interworking					

Category: *(only one category shall be marked with an X)*				**Release:**		
	F	Correction	X		Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
	B	Addition of feature			Release 97	
	C	Functional modification of feature			Release 98	
	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:

Clarifications or corrections on the following five issues are needed.

1) 4.3.2.8 Handling of keys at intersystem change from GSM to UMTS states: "At intersystem change from UMTS to GSM…" when it should state "At intersystem change from GSM to UMTS…".

2) In 10.5.4.5 undefined term "pure UMTS mobile station" is used. This needs to be replaced with "mobile station not supporting GSM".

3) 10.5.5.15 states: " The purpose of the *routing area identification* information element is to provide an unambiguous identification of routing areas within the area covered by the GSM system." This needs to be expanded to concern UMTS, too.

4) The header of annex H states: "GSM specific call control values". Since these values are valid also for UMTS the term "GSM specific" is misleading and should be removed. The term "GSM specific" is used here to distinguish circuit swithced from packet swithced, not to distinguish GSM from UMTS.

5) The header of annex G states: "GSM specific cause values for mobility management". Since these values are valid also for UMTS the term "GSM specific" is misleading and should be removed. In addition, annex G also inludes the values for GMM. Following the logic of current version of 24.008 (see section 4 of this CR), the term "GSM specific" is used to refer to circuit switced part only, and is therefore incorrect.

Clauses affected:

4.3.2.8
10.5.4.5
10.5.5.1
Annex H
Annex G

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	


help.doc

<--------- double-click here for help and instructions on how to create a CR.

4.3.2.8 Handling of keys at intersystem change from GSM to UMTS

At intersystem change from ~~UMTS to GSM~~ GSM to UMTS, ciphering and integrity may be started (see TS 25.331) without any new authentication procedure. Deduction of the appropriate security keys for ciphering and integrity check in UMTS, depend on the current GSM/UMTS security context stored in the MS and the network.

The ME shall handle the UMTS cipher key and the UMTS integrity key according to Table 4.3.2.8.1.

Table 4.3.2.8.1/TS 24.008: Intersystem change from GSM to UMTS

Security context established in MS and network in GSM	At intersystem change to UMTS:
GSM security context	An ME shall derive the UMTS cipher key and UMTS integrity key from the GSM cipher key provided by the SIM. The conversion functions named "c4" and "c5" in TS 33.102 are used for this purpose.
UMTS security context	An ME shall apply the UMTS ciphering key and the UMTS integrity key received from the UMTS security context residing in the SIM.

NOTE A SIM with UMTS security context, passes the UMTS cipher key, the UMTS integrity key and the derived GSM cipher key to the ME independent on the current radio access being UMTS or GSM.

4.3.2.9 Use of established security contexts

In GSM, in the case of an established GSM security context, the GSM ciphering key shall be taken into use by the ME when any valid CIPHERING MODE COMMAND is received during an RR connection (the definition of a valid CIPHERING MODE COMMAND message is given in GSM 04.18 section 3.4.7.2).

In GSM, in the case of an established UMTS security context, the GSM ciphering key shall be taken into use by the MS when a valid CIPHERING MODE COMMAND is received during an RR connection (the definition of a valid CIPHERING MODE COMMAND message is given in GSM 04.18 section 3.4.7.2). The network shall derive a GSM ciphering key from the UMTS ciphering key and the UMTS integrity key by using the conversion function named "c3" defined in TS 33.102.

In UMTS, in the case of an established GSM security context, the ME shall derive a UMTS ciphering key and a UMTS integrity key from the GSM ciphering key by using the conversion functions named "c4" and "c5" defined in TS 33.102. The derived UMTS ciphering key and UMTS integrity key shall be taken into use by the MS when a valid SECURITY MODE COMMAND indicating CS domain is received during an RR connection (the definition of a valid SECURITY MODE COMMAND message is given in TS 25.331). The network shall derive a UMTS ciphering key and a UMTS integrity key from the GSM ciphering key by using the conversion functions named "c4" and "c5" defined in TS 33.102.

In UMTS, in the case of an established UMTS security context, the UMTS ciphering key and UMTS integrity key shall be taken into use by the MS when a valid SECURITY MODE COMMAND indicating CS domain is received during a RR connection (the definition of a valid SECURITY MODE COMMAND message is given in TS 25.331).

NOTE: In UMTS and GSM, during an ongoing, already ciphering and/or integrity protected RR connection, the network might initiate a new Authentication procedure in order to establish a new GSM/UMTS security context. The new keys are taken into use in the MS when a new valid SECURITY MODE COMMAND indicating CS domain in UMTS, or a new valid CIPHERING MODE COMMAND in GSM, is received during the RR connection.

4.3.3 Identification procedure

The identification procedure is used by the network to request a mobile station to provide specific identification parameters to the network e.g. International Mobile Subscriber Identity, International Mobile Equipment Identity (cf. TS 23.003). For the presentation of the IMEI, the requirements of GSM 02.09 apply.

********* next modified section *****

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 following parameters 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)

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

Table 10.5.102/TS 24.008: Bearer capability information element

Radio channel requirement (octet 3), network to MS direction
In GSM, i.e. not applicable for UMTS data services.

Bits 6 and 7 are spare bits. The sending side (i.e. the network) shall set bit 7 to value 0 and bit 6 to value 1.

Radio channel requirement (octet 3) MS to network direction

When information transfer capability (octet 3) indicates other values than speech:
Bits
7 6
0 0 reserved
0 1 full rate support only MS
1 0 dual rate support MS/half rate preferred
1 1 dual rate support MS/full rate preferred

When information transfer capability (octet 3) indicates the value speech and no speech version indication is present in octet 3a etc.:
Bits
7 6
0 0 reserved
0 1 full rate support only MS/fullrate speech version 1 supported
1 0 dual rate support MS/half rate speech version 1 preferred, full rate speech version 1 also supported

1 1 dual rate support MS/full rate speech version 1 preferred, half rate speech version 1 also supported

When information transfer capability (octet 3) indicates the value speech and speech version indication(s) is(are) present in octet 3a etc.:
Bits
7 6
0 0 reserved
0 1 the mobile station supports at least full rate speech version 1 but does not support half rate speech version 1. The complete voice codec preference is specified in octet(s) 3a etc.

1 0 The mobile station supports at least full rate speech version 1 and half rate speech version 1. The mobile station has a greater preference for half rate speech version 1 than for full rate speech version 1. The complete voice codec preference is specified in octet(s) 3a etc.

1 1 The mobile station supports at least full rate speech version 1 and half rate speech version 1. The mobile station has a greater preference for full rate speech version 1 than for half rate speech version 1. The complete voice codec preference is specified in octet(s) 3a etc.

(continued...)

Table 10.5.102/TS 24.008: Bearer capability information element (continued)

Coding standard (octet 3)
Bit
5
0 GSM standardized coding as described below
1 reserved

Transfer mode (octet 3)
Bit
4
0 circuit mode
1 packet mode

Information transfer capability (octet 3)
Bits
3 2 1
0 0 0 speech
0 0 1 unrestricted digital information
0 1 0 3.1 kHz audio, ex PLMN
0 1 1 facsimile group 3
1 0 1 Other ITC (See Octet 5a)
1 1 1 reserved, to be used in the network.
The meaning is: alternate speech/facsimile group 3 - starting with speech.

All other values are reserved

********* next modified section *****

10.5.5.15 Routing area identification

The purpose of the *routing area identification* information element is to provide an unambiguous identification of routing areas within the ~~area covered by the GSM system~~ GPRS coverage area.

The *routing area identification* is a type 3 information element with 7 octets length.

The *routing area identification* information element is coded as shown in figure 10.5.130/TS 24.008 and table 10.5.148/TS 24.008.

8	7	6	5	4	3	2	1	
Routing Area Identification IEI								octet 1
MCC digit 2				MCC digit 1				octet 2
MNC digit 3				MCC digit 3				octet 3
MNC digit 2				MNC digit 1				octet 4
LAC								octet 5
LAC cont'd								octet 6
RAC								octet 7

Figure 10.5.130/TS 24.008: *Routing area identification* information element

Table 10.5.148/TS 24.008: *Routing area identification* information element

MCC, Mobile country code (octet 2 and 3)

The MCC field is coded as in ITU-T Rec. E212, Annex A.
If the RAI is deleted, the MCC and MNC shall take the value from the deleted RAI.

In abnormal cases, the MCC stored in the mobile station can contain elements not in the set {0, 1 ... 9}. In such cases the mobile station should transmit the stored values using full hexadecimal encoding. When receiving such an MCC, the network shall treat the RAI as deleted.

MNC, Mobile network code (octet 4)

The coding of this field is the responsibility of each
administration but BCD coding shall be used. If an
administration decides to include only one digit in the MNC, then bits 5 to 8 of octet 4 are coded as "1111".

Note: TS 23.003 defines that a 2 digit MNC shall be used, however the possibility to use a one digit MNC in LAI is provided on the radio interface

In abnormal cases, the MNC stored in the mobile station can have digit 1 not in the set {0, 1 ... 9} and/or digit 2 not in the set {0, 1 ...9, F} hex. In such cases the mobile station should transmit the stored values using full hexadecimal encoding. When receiving such an MNC, the network shall treat the RAI as deleted.

LAC, Location area code (octet 5 and 6)

In the LAC field bit 8 of octet 5 is the most significant bit and bit 1 of octet 6 the least significant bit.
The coding of the location area code is the responsibility of each administration except that two values are used to mark the LAC, and hence the RAI, as deleted. Coding using full hexadecimal representation may be used.
The location area code consists of 2 octets.
If a RAI has to be deleted then all bits of the location area code shall be set to one with the exception of the least significant bit which shall be set to zero. If a SIM is inserted in a Mobile Equipment with the location area code containing all zeros, then the Mobile Equipment shall recognise this LAC as part of a deleted RAI.

RAC, Routing area code (octet 7)

In the RAC field bit 8 of octet 7 is the most significant. The coding of the routing area code is the responsibility of each administration. Coding using full hexadecimal
representation may be used. The routing area code consists 1 octet.

********* next modified section *****

Annex H (informative): UMTS specific ~~GSM specific~~ cause values for call control

This annex is informative.

H.1 Normal class

H.1.1 Cause No. 1 "unassigned (unallocated) number"

This cause indicates that the destination requested by the mobile station cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

H.1.2 Cause No. 3 "no route to destination"

This cause indicates that the called user cannot be reached because the network through which the call has been routed does not serve the destination desired.

H.1.3 Cause No. 6 "channel unacceptable"

This cause indicates the channel most recently identified is not acceptable to the sending entity for use in this call.

H.1.4 Cause No. 8 "operator determined barring"

This cause indicates that the MS has tried to access a service that the MS's network operator or service provider is not prepared to allow.

H.1.5 Cause No.16 "normal call clearing"

This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared.

Under normal situations, the source of this cause is not the network.

H.1.6 Cause No.17 "user busy"

This cause is used when the called user has indicated the inability to accept another call.

It is noted that the user equipment is compatible with the call.

H.1.7 Cause No. 18 "no user responding"

This cause is used when a user does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time allocated (defined by the expiry of either timer T303 or T310).

H.1.8 Cause No. 19 "user alerting, no answer"

This cause is used when a user has provided an alerting indication but has not provided a connect indication within a prescribed period of time.

********* next modified section *****

Annex G (informative): UMTS specific ~~GSM specific~~ cause values for mobility management

This annex is informative. It describes the cause values for the mobility management procedures for non-GPRS services (MM) and GPRS services (GMM). Sections G1 to G5 are valid for both MM and GMM. However, the following codes are applicable for non-GPRS services only:

#38 Call cannot be identified

Section G.6 applies only for GMM procedures.

G.1 Causes related to MS identification

Cause value = 2 IMSI unknown in HLR

This cause is sent to the MS if the MS is not known (registered) in the HLR. This cause code does not affect operation of the GPRS service, although is may be used by a GMM procedure.

Cause value = 3 Illegal MS

This cause is sent to the MS when the network refuses service to the MS either because an identity of the MS is not acceptable to the network or because the MS does not pass the authentication check, i.e. the SRES received from the MS is different from that generated by the network.

Cause value = 4 IMSI unknown in VLR

This cause is sent to the MS when the given IMSI is not known at the VLR.

Cause value = 5 IMEI not accepted

This cause is sent to the MS if the network does not accept emergency call establishment using an IMEI.

Cause value = 6 Illegal ME

This cause is sent to the MS if the ME used is not acceptable to the network, e.g. blacklisted.

G.2 Cause related to subscription options

Cause value = 11 PLMN not allowed

This cause is sent to the MS if it requests location updating in a PLMN where the MS, by subscription or due to operator determined barring is not allowed to operate.

Cause value = 12 Location Area not allowed

This cause is sent to the MS if it requests location updating in a location area where the MS, by subscription, is not allowed to operate.

Cause value = 13 Roaming not allowed in this location area

This cause is sent to an MS which requests location updating in a location area of a PLMN which offers roaming to that MS in that Location Area, by subscription.

3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

Document N1-000755
REV of Tdoc N1-000616
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

24.008	**CR**	**189 r1**	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSGN#8 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: Ericsson **Date:** 23.05.00

Subject: DRX value 0000 clarification and R97 compatibility issue

Work item: GSM/UMTS interworking

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: With Tdoc N1-000551 the MS specific DRX cycle length was introduced also for UMTS by using the remaing 4 spare bits for that CN specific DRX cycle length coefficient. Clarification is done to when system information value is used as well as only stating the default value for codings not used, for possible reuse of these values later on.
A R99 MS attached to R97 SGSN needs the MM context to be coded with this new field instead of spare coding at inter SGSN (R99) RAU. So the note is expanded with this.

Clauses affected: 10.5.5.6

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

<--------- double-click here for help and instructions on how to create a CR.

10.5.5.6 DRX parameter

The purpose of the *DRX parameter* information element is to indicate whether the MS uses DRX mode or not.

The *DRX parameter* is a type 3 information element with a length of 3 octets.

The value part of a *DRX parameter* information element is coded as shown in table 10.5.139/TS 24.008.

8	7	6	5	4	3	2	1	
DRX parameter IEI								octet 1
SPLIT PG CYCLE CODE								octet 2
CN Specific DRX cycle length coefficient				SPLIT on CCCH	non-DRX timer			octet 3

Figure 10.5.122/TS 24.008: DRX parameter information element

Table 10.5.139/TS 24.008: DRX parameter information element

SPLIT PG CYCLE CODE, octet 2
The octet contains the binary coded value of the SPLIT PG CYCLE CODE. The SPLIT PG CYCLE value is derived from the SPLIT PG CYCLE CODE as follows:

SPLIT PG CYCLE CODE	SPLIT PG CYCLE value
0	704 (equivalent to no DRX)
1 to 64	1 to 64, respectively
65	71
66	72
67	74
68	75
69	77
70	79
71	80
72	83
73	86
74	88
75	90
76	92
77	96
78	101
79	103
80	107
81	112
82	116
83	118
84	128
85	141
86	144
87	150

88	160
89	171
90	176
91	192
92	214
93	224
94	235
95	256
96	288
97	320
98	352

All other values are reserved and shall be interpreted as 1 by this version of the protocol.

SPLIT on CCCH, octet 3 (bit 4)

0 Split pg cycle on CCCH is not supported by the mobile station
1 Split pg cycle on CCCH is supported by the mobile station

non-DRX timer, octet 3

bit 3 2 1	
0 0 0	no non-DRX mode after transfer state
0 0 1	max. 1 sec non-DRX mode after transfer state
0 1 0	max. 2 sec non-DRX mode after transfer state
0 1 1	max. 4 sec non-DRX mode after transfer state
1 0 0	max. 8 sec non-DRX mode after transfer state
1 0 1	max. 16 sec non-DRX mode after transfer state
1 1 0	max. 32 sec non-DRX mode after transfer state
1 1 1	max. 64 sec non-DRX mode after transfer state

CN Specific DRX cycle length coefficient, octet 3

bit 8 7 6 5 (UMTS only)	
0 0 0 0	CN Specific DRX cycle length coefficient not specified by the MS, ie. the system information value 'CN domain specific DRX cycle length' is used. (Ref TS 25.331)
~~0 0 0 1~~	~~Reserved~~
0 0 1 0	CN Specific DRX cycle length coefficient = 2
0 0 1 1	CN Specific DRX cycle length coefficient = 3
0 1 0 0	CN Specific DRX cycle length coefficient = 4
0 1 0 1	CN Specific DRX cycle length coefficient = 5
0 1 1 0	CN Specific DRX cycle length coefficient = 6
0 1 1 1	CN Specific DRX cycle length coefficient = 7
1 0 0 0	CN Specific DRX cycle length coefficient = 8
1 0 0 1	CN Specific DRX cycle length coefficient = 9
1 0 1 0	CN Specific DRX cycle length coefficient = 10
1 0 1 1	CN Specific DRX cycle length coefficient = 11
1 1 0 0	CN Specific DRX cycle length coefficient = 12
~~1 1 0 1~~	~~Reserved~~
~~1 1 1 0~~	~~Reserved~~
~~1 1 1 1~~	~~Reserved~~

All other ~~reserved~~ values shall be interpreted as “CN Specific DRX cycle length coefficient not specified by the MS” by this version of the protocol.

Note: In UMTS ~~T~~this field (octet 3 bits 8 to 5) is used, but was spare in earlier versions of this protocol ~~only for UMTS RAN~~.

3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

Document N1-000756
Rev of N1-000617
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

24.008	**CR**	**190 r1**	Current Version:	3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSGN#8	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: Ericsson **Date:** 25.05.00

Subject: Compatibility issue due to deletion of SM cause #35

Work item: GSM/UMTS interworking

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:
In last N1 meeting deletion of SM cause #35 was made with agreed Tdoc N1-000507. Since #35 is used in R97/R98, the value needs to be reintroduced due to compatibility. A R97/R98 network returns this 'NSAPI already used' in an ACTIVATE PDP CONTEXT REJECT message, leaving the decision to deactivate that PDP context to the MS, or retry another PDP context activation procedure. A R99 network solves that unsynchronous PDP context situation by accepting the new PDP context with equal NSAPI and possibly some changed context parameters (deactivating locally the 'old PDP context'), responding to the MS with an ACTIVATE PDP CONTEXT ACCEPT. So a R99 MS shall react to SM cause#35 from a R97/R98 network to solve the unsynchronous NSAPI situation.

For R99 some clarifications to the abnormal cases are also done.

Clauses affected: 6.1.3.1, 10.5.6.6, Annex I.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments: In ii) first bullet a question is raised if activating PDP context with same combination of PDP type, PDP address and APN is allowed or not ?

<--------- double-click here for help and instructions on how to create a CR.

6.1.3.1.3 Unsuccessful PDP context activation initiated by the MS

Upon receipt of an ACTIVATE PDP CONTEXT REQUEST message the network may reject the MS initiated PDP context activation by sending an ACTIVATE PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following causes:

26: insufficient resources;
27: missing or unknown APN;
28: unknown PDP address or PDP type;
29: user authentication failed;
30: activation rejected by GGSN;
31: activation rejected, unspecified;
32: service option not supported;
33: requested service option not subscribed;
34: service option temporarily out of order;~~or~~
35: NSAPI already used, not sent but can be received from a pre-R99 network;or
95 - 111: protocol errors.

Upon receipt of an ACTIVATE PDP CONTEXT REJECT message, the MS shall stop timer T3380 and enter/remain in state PDP-INACTIVE.

6.1.3.1.4 Unsuccessful PDP context activation requested by the network

Upon receipt of the REQUEST PDP CONTEXT ACTIVATION message, the MS may reject the network requested PDP context activation by sending the REQUEST PDP CONTEXT ACTIVATION REJECT message to the network. The message contains the same TI as included in the REQUEST PDP CONTEXT ACTIVATION and an additional cause code that typically indicates one of the following causes:

26: insufficient resources;
31: activation rejected, unspecified;
40: feature not supported; or
95 - 111: protocol errors.

The network shall stop timer T3385 and enter state PDP-INACTIVE.

6.1.3.1.5 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

In the mobile station:

On the first expiry of the timer T3380, the MS shall resend the ACTIVATE PDP CONTEXT REQUEST and shall reset and restart timer T3380. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3380, the MS shall release all resources possibly allocated for this invocation and shall abort the procedure; no automatic PDP context activation re-attempt shall be performed.

On the network side:

On the first expiry of the timer T3385, the network shall resend the message REQUEST PDP CONTEXT ACTIVATION and shall reset and restart timer T3385. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3385, the network shall release possibly allocated resources for this activation and shall abort the procedure.

b) Collision of MS initiated and network requested PDP context activation

Dynamic PDP address collision case:

If the MS uses dynamic PDP addressing that turns out to collide with the network requested PDP address, then there is no detection of collision specified but left for network implementation.

Static PDP address collision detected within the mobile station:

A collision of an MS initiated and a network requested PDP context activation procedure is identified by the MS if a REQUEST PDP CONTEXT ACTIVATION message is received from the network after the MS has sent an ACTIVATE PDP CONTEXT REQUEST message, and the MS has not yet received an ACTIVATE PDP CONTEXT ACCEPT or ACTIVATE PDP CONTEXT REJECT message.

Note: In general, the MS is unable to test if the PDP type, PDP address and APN in the REQUEST PDP CONTEXT ACTIVATION message are the same as those for the PDN to which it is attempting to activate a context. This is because the MS may have omitted one or more of the parameters in the ACTIVATE PDP CONTEXT REQUEST message, since it is relying on default values to be provided by the network.

- In the case of such a collision, the MS initiated PDP context activation shall take precedence over the network requested PDP context activation. If the MS is able to compare the PDP type, PDP address and APN requested in the ACTIVATE PDP CONTEXT REQUEST message with those requested in the REQUEST PDP CONTEXT ACTIVATION message and these parameters are equal, then the MS shall discard the REQUEST PDP CONTEXT ACTIVATION message and shall wait for the network response to its ACTIVATE PDP CONTEXT REQUEST message. If the MS is not able to compare the PDP type, PDP address, and APN requested in the ACTIVATE PDP CONTEXT REQUEST message with those requested in the REQUEST PDP CONTEXT ACTIVATION message, then the MS shall send a REQUEST PDP CONTEXT ACTIVATION REJECT message with the cause 'insufficient resources' to the network, and wait for an ACTIVATE PDP CONTEXT ACCEPT message.

Static PDP address collision detected on the network side:

A collision is detected by the network in the case where the PDP address, PDP type and APN derived (according to 23.060 annex A) from the ACTIVATE PDP CONTEXT REQUEST message received from the MS match those in the REQUEST PDP CONTEXT ACTIVATION message sent to the MS.

- In the case of such a collision, the MS initiated PDP context activation shall take precedence over the network requested PDP context activation. The network shall terminate the network requested PDP context activation procedure, and proceed with the MS initiated PDP context activation procedure

c) MS initiated PDP context activation request for an already activated PDP context (on the network side)

i) If all parameters of the new ACTIVATE PDP CONTEXT REQUEST message match with those of a previously activated PDP context~~,without linked PDP context (activated contexts with the same PDP type, PDP address and APN)~~ and the context to be activated uses static PDP addressing~~.~~ then the network may reply with an ACTIVATE PDP CONTEXT ACCEPT message immediately.
If dynamic PDP addressing is indicated for the new context then it is left for the implementation to decide if the PDP addresses match.

ii) Alternatively to i) above the network shall take the action described below:

- If not all parameters (ie. NSAPI) but the combination of PDP Type, PDP address and APN matches with those of an already activated PDP context(s), the network shall deactivate all these existing PDP contexts, which match the combination of APN, PDP type and PDP address, locally without notification to the MS and proceed with the requested PDP context activation.

- ~~Otherwise, i~~If not all parameters but the NSAPI matches one of an already activated PDP context(s), then the network shall deactivate this PDP context and all the possible PDP contexts linked with this one locally without notification to the MS and proceed with the ~~activation of the~~ requested PDP context activation.

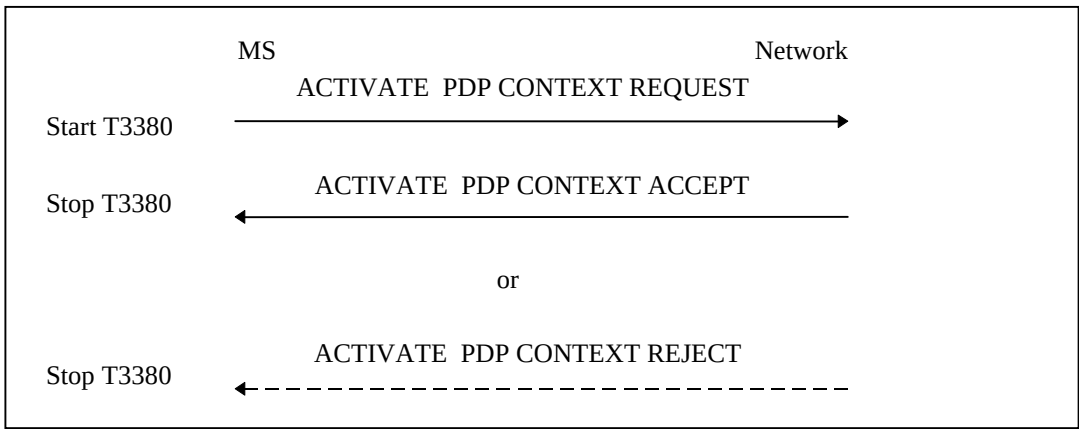
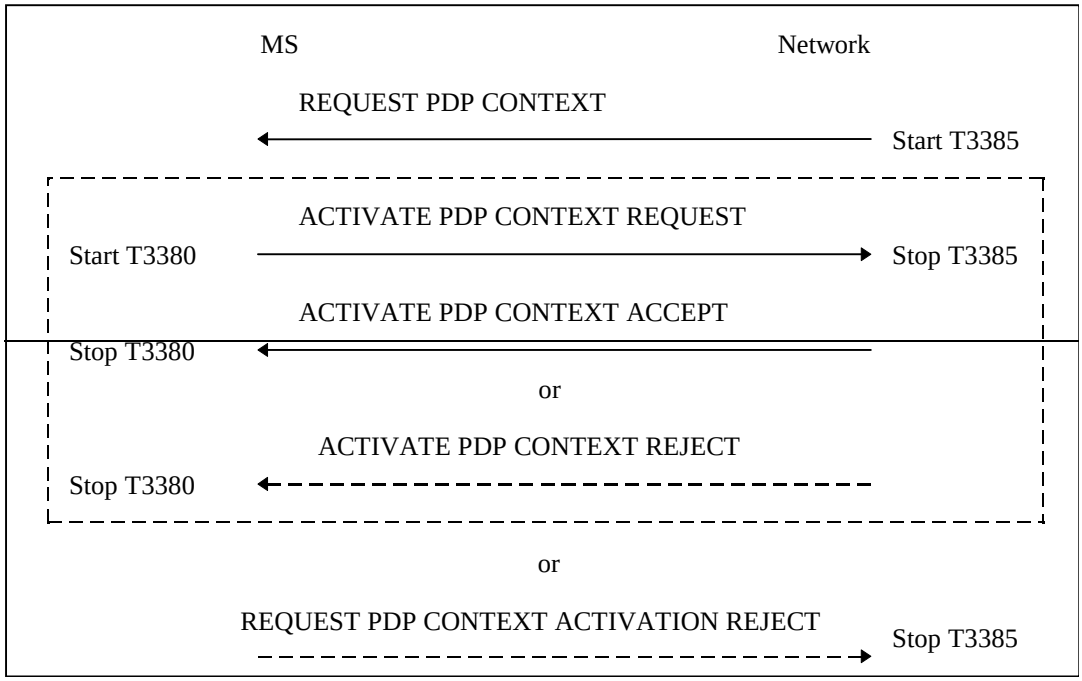


Figure 6.3/TS 24.008: MS initiated PDP context activation procedure



~~Figure 6.4/TS 24.008: Network initiated PDP context activation procedure~~

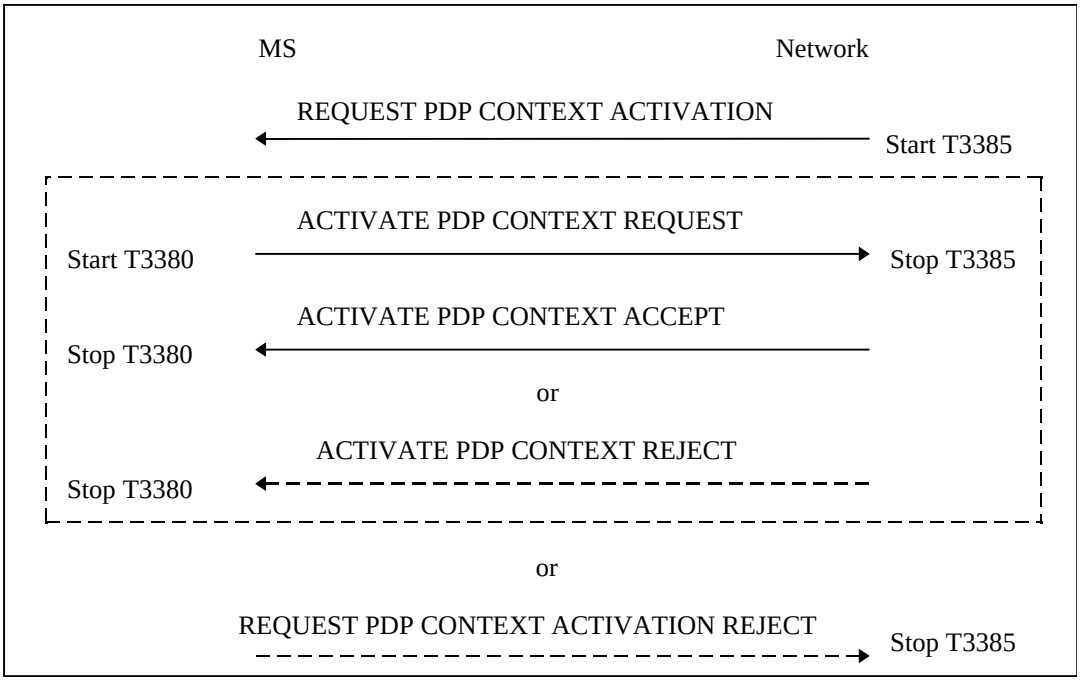


Figure 6.4/TS 24.008: Network initiated PDP context activation procedure

10.5.6.6 SM cause

The purpose of the *SM cause* information element is to indicate the reason why a session management request is rejected.

The *SM cause* is a type 3 information element with 2 octets length.

The *SM cause* information element is coded as shown in figure 10.5.139/TS 24.008 and table 10.5.157/TS 24.008.

8	7	6	5	4	3	2	1	
SM cause IEI								octet 1
Cause value								octet 2

Figure 10.5.139/TS 24.008: *SM cause* information element

Table 10.5.157/TS 24.008: *SM cause* information element

```
Cause value (octet 2)
Bits
8 7 6 5 4 3 2 1
0 0 0 1 1 0 0 1    LLC or SNDCP failure(GSM only)
0 0 0 1 1 0 1 0    Insufficient resources
0 0 0 1 1 0 1 1    Missing or unknown APN
0 0 0 1 1 1 0 0    Unknown PDP address or PDP type
0 0 0 1 1 1 0 1    User Aauthentication failed
0 0 0 1 1 1 1 0    Activation rejected by GGSN
0 0 0 1 1 1 1 1    Activation rejected, unspecified
0 0 1 0 0 0 0 0    Service option not supported
0 0 1 0 0 0 0 1    Requested service option
                   not subscribed
0 0 1 0 0 0 1 0    Service option temporarily
                   out of order
0 0 1 0 0 0 1 1    NSAPI already used (not sent)
0 0 1 0 0 1 0 0    Regular deactivation
0 0 1 0 0 1 0 1    QoS not accepted
0 0 1 0 0 1 1 0    Network failure
0 0 1 0 0 1 1 1    Reactivation required
0 0 1 0 1 0 0 1    Semantic error in the
                                        TFT operation
0 0 1 0 1 0 1 0    Syntactical error in the
                   TFT operation
0 0 1 0 1 0 1 1    Unknown PDP context
0 0 1 0 1 1 1 0    PDP context without TFT already
activated
0 0 1 0 1 1 0 0    Semantic errors in packet filter(s)
0 0 1 0 1 1 0 1    Syntactical errors in packet
                                      filter(s)
0 1 0 1 0 0 0 1    Invalid transaction identifier value
0 1 0 1 1 1 1 1    Semantically incorrect message
0 1 1 0 0 0 0 0    Invalid mandatory information
0 1 1 0 0 0 0 1    Message type non-existent
                   or not implemented
0 1 1 0 0 0 1 0    Message type not compatible with
                   the protocol state
0 1 1 0 0 0 1 1    Information element non-existent
                   or not implemented
0 1 1 0 0 1 0 0    Conditional IE error
0 1 1 0 0 1 0 1    Message not compatible with
                   the protocol state
0 1 1 0 1 1 1 1    Protocol error, unspecified

Any other value received by the mobile station shall
be treated as 0010 0010, 'Service option temporarily
out of order'. Any other value received by the network
shall be treated as 0110 1111, 'Protocol error,
unspecified'.

NOTE: The listed cause values are defined in
      Annex I
```

I.1 Causes related to nature of request

Cause value = 25 LLC or SNDCP failure (GSM only)

This cause code is used by the MS indicate that a PDP context is deactivated because of a LLC or SNDCP failure (e.g. if the SM receives a *SNSM-STATUS.request* message with cause "*DM received* " or " *invalid XID response* ", see GSM 04.65 [78])

Cause value = 26 Insufficient resources

This cause code is used by the MS or by the network to indicate that a PDP context activation request, secondary PDP context activation request or PDP context modification request cannot be accepted due to insufficient resources.

Cause value = 27 Unknown or missing access point name

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the access point name was not included although required or if the access point name could not be resolved.

Cause value = 28 Unknown PDP address or PDP type

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the PDP address or type could not be recognised.

Cause value = 29 User authentication failed

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network due to a failed user authentication.

Cause value = 30 Activation rejected by GGSN

This cause code is used by the network to indicate that the requested service was rejected by the GGSN.

Cause value = 31 Activation rejected, unspecified

This cause code is used by the network to indicate that the requested service was rejected due to unspecified reasons.

Cause value = 32 Service option not supported

This cause code is used by the network when the MS requests a service which is not supported by the PLMN.

Cause value = 33 Requested service option not subscribed

See Annex G, section 4.

Cause value = 34 Service option temporarily out of order

See Annex G, section 4.

Cause value = 35 NSAPI already used

This cause code may be used by a network to indicate that the NSAPI requested by the MS in the PDP context activation request is already used by another active PDP context of this MS.

Never to be sent, but can be received from a R97/R98 network at PDP context activation

Cause value = 36 Regular PDP context deactivation

This cause code is used to indicate a regular MS or network initiated PDP context deactivation.

Cause value = 37 QoS not accepted

This cause code is used by the MS if the new QoS cannot be accepted that were indicated by the network in the PDP Context Modification procedure.

Cause value = 38 Network failure

This cause code is used by the network to indicate that the PDP context deactivation is caused by an error situation in the network.

Cause value = 39 Reactivation requested

This cause code is used by the network to request a PDP context reactivation after a GGSN restart.

Cause value = 40 Feature not supported

This cause code is used by the MS to indicate that the PDP context activation initiated by the network is not supported by the MS.

Cause value = 41 semantic error in the TFT operation.

This cause code is used by the network to indicate that the there is a semantic error in the TFT operation included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 42 syntactical error in the TFT operation.

This cause code is used by the network to indicate that there is a syntactical error in the TFT operation included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 43 unknown PDP context

This cause code is used by the network to indicate that the PDP context identified by the Linked TI IE the secondary PDP context activation request is not active.

Cause value = 44 semantic errors in packet filter(s)

This cause code is used by the network to indicate that there is one or more semantic errors in packet filter(s) of the TFT included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 45 syntactical error in packet filter(s)

This cause code is used by the network to indicate that there is one or more syntactical errors in packet filter(s) of the TFT included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 46 PDP context without TFT already activated

This cause code is used by the network to indicate that the network has already activated a PDP context without TFT.

N1-000794
Rev. of N1-000737

3GPP TSG-CN WG1 #12 ***Document***
Hawaii, USA, 22 – 26 May 2000

CHANGE REQUEST

24.008	CR	195r2	Current Version:	3.3.1

For submission to: TSG CN#8 — for approval [X] / for information [ ] — strategic [ ] / non-strategic [X]

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: Nokia **Date:** 26.5.2000

Subject: MS behavior if RAU attempt counter is greater than or equal to 5

Work item: GSM/UMTS interworking

Category:

F	Correction	[X]
A	Corresponds to a correction in an earlier release	[ ]
B	Addition of feature	[ ]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Release:

Phase 2	[ ]
Release 96	[ ]
Release 97	[ ]
Release 98	[ ]
Release 99	[X]
Release 00	[ ]

Reason for change: It is specified in 24.008 how MS shall behave if the routing are updating attempt counter is greater than or equal to 5. This CR proposes to add a feature that MS shall also release the PS signaling connection in such situation.

Clauses affected: 4.7.5.1.5

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments: The abnormal cases for RA update have been aligned with the existing text in section 4.7.3.1.5 Abnormal cases (for GPRS attach) in the MS side.

4.7.5.1.5 Abnormal cases in the MS

The following abnormal cases can be identified:

a) Access barred because of access class control

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

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

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

c) T3330 time-out

The procedure is restarted four times, i.e. on the fifth expiry of timer T3330, the MS shall abort the procedure. The MS shall proceed as described below.

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

The MS shall proceed as described below.

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

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

g) Routing area updating and detach procedure collision

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

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

GPRS detach containing detach type "IMSI detach":

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

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

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

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

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

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

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

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

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

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

- the MS shall start timer T3302, shall set the GPRS update status to GU2 NOT UPDATED and shall change to state GMM-REGISTERED.ATTEMPTING-TO-UPDATE or optionally to GMM-REGISTERED.PLMN-SEARCH(see 4.2.4.1.2).

- In UMTS, in case c the MS shall release the PS signaling connection and in case d the network shall release the PS signaling connection for this MS (see TS 25.331).

3GPP TSG CN WG1 Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

Document N1-000796

Revision of N1-000719, N1-000630 , N1-000538

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.122	CR	003 rev 5	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN#8	for approval	X	strategic		(for SMG Use only)
list expected approval meeting # here ↑	for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: Ericsson **Date:** 12-05-2000

Subject: Modification of PLMN Selection Procedures to support UMTS+COMPACT Network Selection

Work item: GSM / UMTS interworking

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Modifications are required to 23.122 to support the requirements in the latest 22.011

Clauses affected: See below

Other specs Affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

Revision History:

(1) Tdoc N1-000303 was a merge between N1-000285 and N1-000301, with some editorial improvements

(2) Tdoc N1-000583 was an update of Tdoc N1-000303, incorporating comments received after presentation in N1.

(3) Tdoc N1-000630 is an updated of Tdoc N1-000538, incorporating additional comments from Siemens and some changes due to internal (Ericsson) review.

~~(3)~~(4) Tdoc N1-000719 updated after presentation of Tdoc N1-000630 and joint meeting N1-R2 on 23 May 2000 in Hawaii. Extension of the scan of HPLMN and RPLMN for all supported access technologies.

(5) Tdoc N1-000796 updated following editorial comments during presentation of Tdoc N1-000719

help.doc

<--------- double-click here for help and instructions on how to create a CR.

***** First modified section *****

1 Scope

~~Text to be added.~~

The present document gives an overview of the tasks relating to the NAS undertaken by a GSM or an UMTS Mobile Station (MS) in idle mode. In particular this is the stage 2 specification for PLMN Selection and Location Registration.

NOTE: The term "idle mode" is a long standing GSM term meaning the MS is switched on but not having a dedicated channel allocated, (e.g. not making or receiving a call).

The present document outlines how the requirements of the 22 series Technical Specifications (especially UMTS 22.011) on idle mode operation shall be implemented. Further details are given in UMTS 24.008.

***** Next modified section *****

1.2 Definitions and abbreviations

Abbreviations used in this TS are listed in GSM 01.04 and UMTS 21.905.

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

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

Available PLMN This is a PLMN where the MS has found a cell that satisfies conditions (ii) and (iv) of subclause 3.2.1 in GSM 03.22. For UMTS the criteria is specified in UMTS 25.304..

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

Allowable PLMN This is a PLMN which is not in the list of forbidden PLMNs in the MS.

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

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

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

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

Suitable Cell This is a cell on which an MS may camp. It must satisfy criteria which is defined for GSM in GSM 03.22 and for UMTS in UMTS 25.304.

Acceptable Cell This is a cell that the MS may camp on to make emergency calls. It must satisfy criteria which is defined for GSM in GSM 03.22 and for UMTS in UMTS 25.304.

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

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

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

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

Access Technology The access technology associated with ~~HPLMN or~~ a PLMN ~~in the PLMN selector lists (see GSM 11.11)~~. The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN (e.g., GSM, UMTS or GSM COMPACT). A PLMN may support more than one access technology.~~**Network Type** The network type associated with HPLMN or a PLMN on the PLMN selector (see GSM 11.11). The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN. A PLMN may support more than one network type.~~

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

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

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

In GSM,... Indicates this paragraph applies only to GSM System. For multi system case this is determined by the current serving radio access network.

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

(GSM only) Indicates this section or paragraph applies only to GSM system. For multi system case this is determined by the current serving radio access network.

(UMTS only) Indicates this section or paragraph applies only to UMTS system. For multi system case this is determined by the current serving radio access network.

SIM Subscriber Identity Module (see TS GSM 02.17). This specification makes no distinction between SIM and USIM.

MS Mobile Station. This specification makes no distinction between MS and UE.

***** Next modified section *****

2 General description of idle mode

When an MS is switched on, it attempts to make contact with a ~~GSM~~ public land mobile network (PLMN)~~, using a certain access technology~~. The particular PLMN to be contacted may be selected either automatically or manually.

The MS looks for a suitable cell of the chosen PLMN and chooses that cell to provide available services, and tunes to its control channel. This choosing is known as "camping on the cell". The MS will then register its presence in the registration area of the chosen cell if necessary, by means of a location registration (LR), GPRS attach or IMSI attach procedure.

If the MS loses coverage of a cell, or find a more suitable cell, it reselects onto the most suitable ~~alternative~~ cell of the selected PLMN and camps on that cell. If the new cell is in a different registration area, an LR request is performed.

If the MS loses coverage of a PLMN, either a new PLMN is selected automatically, or an indication of which PLMNs are available is given to the user, so that a manual selection can be made.

Registration is not performed by MSs only capable of services ~~which~~ that need no registration~~. for example GPRS services PTM-M or PTP anonymous access.~~

The purpose of camping on a cell in idle mode is ~~threefold~~fourfold:

a) It enables the MS to receive system information from the PLMN.

b) If the MS wishes to initiate a call, it can do this by initially accessing the network on the control channel of the cell on which it is camped (with the exceptions defined in GSM 03.22 subclauses 3.5.3 and 3.5.4 and UMTS 25.304).

c) ~~c)~~ If the PLMN receives a call for the MS, it knows (in most cases) the registration area of the cell in which the MS is camped. It can then send a "paging" message for the MS on control channels of all the cells in the registration area. The MS will then receive the paging message because it is tuned to the control channel of a cell in that registration area, and the MS can respond on that control channel.

d) It enables the MS to receive cell broadcast messages.

If the MS is unable to find a suitable cell to camp on, or the SIM is not inserted, or if it receives certain responses to an LR request (e.g., "illegal MS"), it attempts to camp on a cell irrespective of the PLMN identity, and enters a "limited service" state in which it can only attempt to make emergency calls.

In GSM, if the CTS MS is in CTS mode only or in automatic mode with CTS preferred, it will start by attempting to find a CTS fixed part on which it is enrolled

The idle mode tasks can be subdivided into 4 processes:

- PLMN selection;
- Cell selection and reselection;
- Location registration;
- CTS fixed part selection (GSM only).

In GSM, t~~T~~o make this initial CTS fixed part selection, the MS shall be enrolled on at least one fixed part.

The relationship between these processes is illustrated in figure 1 in clause 5. The states and state transitions within each process are shown in figures 2 to 4 in clause 5.

***** Next modified section *****

3.1 PLMN selection and roaming

The MS normally operates on its home PLMN (HPLMN). However a visited PLMN (VPLMN) may be selected, e.g., if the MS loses coverage. There are two modes for PLMN selection:

i) Automatic mode - This mode utilizes a list of PLMNs in priority order. The highest priority PLMN which is available and allowable is selected.

ii) Manual mode - Here the MS indicates to the user which PLMNs are available. Only when the user makes a manual selection does the MS try to obtain normal service on the VPLMN.

There are two cases:

- International Roaming - This is where the MS receives service on a PLMN of a different country than that of the HPLMN.

- National Roaming - This is where the MS receives service from a PLMN of the same country as that of the HPLMN, either anywhere or on a regional basis. The MS makes a periodic search for the HPLMN while national roaming.

To prevent repeated attempts to have roaming service on a not allowed LA, when the MS is informed that an LA is forbidden, the LA is added to a list of "forbidden LAs for roaming" which is stored in the MS. This list is deleted when the MS is switched off or when the SIM is removed. Such area restrictions are always valid for complete location areas independent of possible subdivision into GPRS routing areas. The structure of the routing area identifier (UMTS 23.003) supports area restriction on LA basis.

If a "PLMN not allowed" message is received by an MS in response to an LR request from a VPLMN, that VPLMN is added to a list of "forbidden PLMNs" in the SIM and thereafter that VPLMN will not be accessed by the MS when in automatic mode. A PLMN is removed from the "forbidden" list if, after a subsequent manual selection of that PLMN, there is a successful LR. This list is retained when the MS is switched off or the SIM is removed. The HPLMN shall not be stored on the list of "forbidden PLMNs".

In GSM, an~~A~~ ME not supporting SoLSA may consider a cell with the escape PLMN code (see UMTS 23.073) to be a part of a PLMN belonging to the list of "forbidden PLMNs".

Optionally the ME may store in its memory an extension of the forbidden PLMN list. The contents of the extension of the list shall be deleted when the MS is switched off or the SIM is removed.

***** Next modified section *****

3.5 No suitable cell (limited service state)

There are a number of situations in which the MS is unable to obtain normal service from a PLMN. These include:

a) Failure to find a suitable cell of the selected PLMN;

b) No SIM in the MS;

c) A "PLMN not allowed" response to an LR;

d) An "illegal MS", "illegal ME" or "IMSI unknown in HLR" response to an LR; (Any SIM in the ME is then considered "invalid".)

e) A "GPRS not allowed“ response to an LR of a GPRS MS attached to GPRS services only. (The cell selection state of GPRS MSs attached to GPRS and non-GPRS depends on the outcome of the location updating.)

(In automatic PLMN selection mode, events (a), (c) and (e) would normally cause a new PLMN selection, but even here, the situation may arise when no PLMNs are available and allowable for use).

Under any of these conditions, the MS attempts to camp on an acceptable cell, irrespective of its PLMN identity, so that emergency calls can be made if necessary. When in the limited service state with a valid SIM, the MS shall search for available and allowable PLMNs in the manner described in subclause 4.4.3.1 and when indicated in the SIM also as described in subclause 4.4.3.4. No LR requests are made until a valid SIM is present and either a suitable cell is found or a manual network reselection is performed. In the limited service state the presence of the MS need not be known to the PLMN on whose cell it has camped.

There are also other conditions under which only emergency calls may be made. These are shown in table 2 in clause 5.

***** Next modified section *****

4.2 States description

Each of the processes of PLMN selection, cell selection and location registration can be described by a set of states. The overall state of the mobile is thus a composite of the states of the three processes. In some cases, an event which causes a change of state in one process may trigger a change of state in another process, e.g., camping on a cell in a new registration area triggers an LR request. The relationship between the processes is illustrated in figure 1 in clause 5.

The states in which the MS may be, for each of the processes, are described below and illustrated in figures 2 to 4 in clause 5. For many of the states, a fuller description can be found in other ~~GSM~~ Technical Specifications, and a reference to the ~~GSM~~ Technical Specification ~~and the relevant section within it, are~~is given after the state description.

In the event of any conflict between the diagrams and the text in this ETS, the text takes precedence.

***** Next modified section *****

4.3.3 List of states for location registration (figure 4)

The states are entered depending on responses to location registration (LR) requests. Independent update states exist for GPRS and for non-GPRS operation in MSs capable of GPRS and non-GPRS services.

L1 Updated - The MS enters this state if an LR request is accepted. The update status is set to "updated". The GPRS and the non-GPRS update state of a MS may enter "updated“ as a result of combined signalling or as a result of individual signalling depending on the capabilities of the network.

L2 Idle, No IMSI - The MS enters this state if an LR request is rejected with cause:

a) IMSI unknown in HLR;

b) illegal ME;

c) illegal MS;

d) GPRS services and non-GPRS services not allowed;

or if there is no SIM. All update states of a MS enter this state regardless whether received by individual or combined signalling for events b) and c). ~~Event a) results in "Roaming not allowed“ for the non-GPRS update state only.~~ Event a) has no influence on the GPRS update state. Events b), c) and d) results in "Roaming not allowed“ for the GPRS update state ~~only. Event d) has no influence on the non-GPRS update state.~~

If a SIM is present, the non-GPRS update status of the SIM is set to "Roaming not allowed". ~~for events a), b) and c).~~

L3 Roaming not allowed - The MS enters this state if it receives an LU reject message with the cause:

a) PLMN not allowed;

b) Location area not allowed;

c) Roaming not allowed in this location area.

All update states of the MS are set to "Roaming not allowed" regardless whether received by individual or combined signalling. The behaviour of the MS in the roaming not allowed state is dependent on the LR reject cause as shown in table 2 in clause 5. Additionally:

- in automatic mode, "PLMN not allowed" and "roaming not allowed in this location area" cause the Automatic Network Selection procedure of subclause 4.4.3.1.1~~A~~ to be started; it is also caused by "GPRS not allowed“ when received by a MS capable of GPRS only;

- in manual mode, "PLMN not allowed" and "roaming not allowed" cause the Manual Network Selection procedure of subclause 4.4.3.1.2~~B~~ to be started; it is also caused by "GPRS not allowed" when received by MS capable of GPRS only.

L4 Not updated - The MS enters this state if any LR failure not specified for states L2 or L3 occurs, in which cases the MS is not certain whether or not the network has received and accepted the LR attempt. The non-GPRS update status on the SIM and/or the GPRS update status are set to "not updated" depending on the specific location registration procedure and their outcome.

NOTE This clause does not describe all the cases. For more details refer to ~~UM~~TS 24.008 [23]

***** Next modified section *****

4.4 PLMN selection process

4.4.1 Introduction

There are two modes for PLMN selection, automatic and manual. These are described in subclauses 4.4.3 below and illustrated in figures 2a to 2b in clause 5.

4.4.2 Registration on a PLMN

The MS shall perform registration on the PLMN if the MS is capable of services which require registration. In both automatic and manual modes, the concept of registration on a PLMN is used. An MS successfully registers on a PLMN if:

a) The MS has found a suitable cell of the PLMN to camp on; and

b) An LR request from the MS has been accepted in the registration area of the cell on which the MS is camped (see table 1).

4.4.3 PLMN selection

The registration on the selected PLMN and the location registration are only necessary if the MS is capable of services which require registration. Otherwise, the PLMN selection procedures are performed without registration.

~~The access technologies for the HPLMN are stored on the SIM in priority order.~~

~~NOTE: To allow provision for multiple HPLMN codes, the HPLMN access technologies are stored on the SIM using the same format as the User Controlled PLMN Selector with Access Technology and Operator Controlled PLMN Selector with Access Technology data fields. It is assumed in this version of the specification that this HPLMN Selector with Access Technology data field should contain only one PLMN code, although this single code may be duplicated in the list if multiple access technologies with priority is defined.~~

The HPLMN Selector with Access Technology, User Controlled PLMN Selector with Access Technology and Operator Controlled PLMN Selector with Access Technology data fields in the SIM include associated access technologies for each PLMN entry, see GSM 11.11 [32]. The PLMN/access technology combinations are listed in priority order. If an ~~PLMN~~ entry includes more than one access technology, then no priority is defined for the preferred access technology and the priority is an implementation issue. ~~Alternatively, if priority is required, the same PLMN code may be duplicated in the list(s) but with different access technologies associated in each case. In this case the MS shall select the access technology according to the order in the PLMN Selector list.~~

NOTE: To allow provision for multiple HPLMN codes, the HPLMN access technologies are stored on the SIM using the same format as the User Controlled PLMN Selector with Access Technology and Operator Controlled PLMN Selector with Access Technology data fields. It is assumed in this version of the specification that this HPLMN Selector with Access Technology data field should contain only one PLMN code identical to the HPLMN code included in the IMSI. Although this single code may be duplicated in the list if multiple access technologies with priority is defined.

NOTE: Different GSM frequency bands (eg. 900, 1800, 1900, 400) are all considered GSM access technology. An MS supporting more than one band should scan all the bands it's supports when scanning for GSM frequencies. However GSM COMPACT systems which use GSM frequency bands but with the CBPCCH broadcast channel are considered as a separate access technology from GSM.

~~NOTE: Duplicate PLMNs and associated access technology entries in selector lists may be ignored and the highest priority entries may be handled only.~~

4.4.3.1 At switch-on or recovery from lack of coverage

At switch on, the MS selects the registered PLMN (if it is available) using all access technologies that the MS is capable of and attempts to perform a Location Registration. ~~on the registered PLMN, if it exists, using the access technology type determined from the RPLMN last used access technology stored on the SIM. (If the RPLMN last used access technology does not exist in the SIM then an MS capable of more than one access technology shall use GSM access technology.)~~ The MS shall start its search using the access technology type stored in the RPLMN Last Used Access Technology data field on the SIM. If the RPLMN Last Used Access Technology is not available then an MS capable of GSM access technology shall start its search using GSM access technology.

On recovery from lack of coverage, the MS selects the registered PLMN (if it ~~exists~~ is available) using all access technologies that the MS is capable of and, if necessary (see subclause 4.5.2) attempts to perform a Location Registration~~, using all access technology types that the MS is capable of~~.

EXCEPTION: In GSM or GSM COMPACT, an MS with voice capability, or an MS not supporting packet services shall not search for CPBCCH carriers, unless the RPLMN Last Used Access Technology field is available in the SIM and indicates GSM COMPACT.

If successful registration is achieved, the MS indicates the selected PLMN.

If there is no registered PLMN, or if registration is not possible due to the PLMN being unavailable or registration failure, the MS follows one of the following two procedures depending on its operating mode.

EXCEPTION: If registration is not possible on recovery from lack of coverage due to the registered PLMN being unavailable, a MS attached to GPRS services may, optionally, continue looking for the registered PLMN for an implementation dependent time.

NOTE: A MS attached to GPRS services should use the above exception only if one or more PDP contexts are currently active.

~~A)~~4.4.3.1.1 Automatic Network Selection Mode Procedure

The MS selects and attempts registration on other PLMNs, if available and allowable, ~~in all of its bands of operation~~using all supported access technologies that the MS is capable of, in the following order:

i) HPLMN (if not previously selected);

ii) ~~ii)~~ each PLMN in the "User Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iii) each PLMN in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iv) ~~other PLMNs~~ other PLMN/access technology combinations with received high quality signal in random order;

v) ~~all other~~ other PLMN/access technology combinations ~~PLMNs~~ in order of decreasing signal quality.

~~iii) other PLMNs with received high quality signal in random order;~~

~~iv) all other PLMNs in order of decreasing signal quality.~~

When following the above procedure the following requirements apply:

a) In GSM or GSM COMPACT, a~~A~~n MS with ~~GSM~~ voice capability shall ignore PLMNs for which the MS has identified at least one cell that do not offer voice service. (In GSM, this is indicated by the CELL_BAR_QUALIFY_2 parameter).~~transmits CELL_BAR_QUALIFY_2.~~

b) In GSM or GSM COMPACT, a~~A~~n MS with ~~GSM~~ voice capability, or an MS not supporting packet services shall not search for CPBCCH carriers.

c) In ~~step~~ ~~i,~~ ii and iii, the MS should limit its search ~~of~~ for the PLMN to the ~~network type~~access technology or access technologies~~s~~ ~~to the one~~ associated with the PLMN ~~which it is attempting to select and register to~~ in the appropriate PLMN Selector with Access Technology list (~~HPLMN or any~~User Controlled ~~PLMN on the PLMN~~ or Operator Controlled selector list). An MS using a SIM without access technology information storage (i.e. ~~the HPLMN Selector with Access Technology,~~ User Controlled PLMN Selector with Access Technology and the Operator Controlled PLMN Selecti~~on~~or with Access Technology data fields are not present) shall instead use the PLMN Selector data field and assume GSM access technology as the highest priority radio access technology for all PLMNs. ~~If a PLMN entry on the PLMN selector specifies more than one network type, the MS may scan for network types in the order of the time it takes to identify them (with the exception of requirement b), starting with the network type that takes the shortest time to identify~~.

d) In ~~step~~ ~~iii~~ iv and ~~iv~~, the MS shall search for all ~~network type~~access technologies it is capable of~~, with the exception of requirement b)~~, before deciding which PLMN to select.

~~e) A MS , that does not have any stored network type information on the SIM shall first go through the steps by only searching for the BCCH network type. If no successful registration is achieved, then the COMPACT capable MS without GSM voice shall redo the procedure assuming that all PLMNs may be supporting all network types.~~

e) In i, ii, and iii, a packet only MS which supports GSM COMPACT, but using a SIM without access technology information storage (i.e. the HPLMN Selector with Access Technology, User Controlled PLMN Selector with Access Technology and the Operator Controlled PLMN Selecti~~on~~or with Access Technology data fields are not present) shall instead use the PLMN Selector data field and assume GSM COMPACT access technology as the lowest priority radio access technology for all PLMNs.

f) In i, the MS shall search for all access technologies it is capable of. The MS shall start its search using the access technologies stored in the HPLMN Selector with Access Technology data field on the SIM in priority order.

~~NOTE 2: Requirements a) and b) do not apply to MSs supporting GSM circuit switched data without supporting GSM voice.~~

NOTE: Requirements a) and b) apply also to requirement d), so a GSM voice capable MS should not search for GSM COMPACT PLMNs, even if capable of GSM COMPACT.

NOTE: Requirements a) and b) apply also to requirement f), so a GSM voice capable MS should not search for GSM COMPACT PLMNs, even if this is the only access technology on the HPLMN Selector with Access Technology data field on the SIM. Also PLMNs not offering voice services should be ignored by voice capable GSM mobiles.

NOTE ~~3~~: High quality signal is defined in the appropriate AS specification.

If successful registration is achieved, the MS indicates the selected PLMN.

If registration cannot be achieved because no PLMNs are available and allowable, the MS indicates "no service" to the user, waits until a new PLMN is available and allowable and then repeats the procedure.

If there were one or more PLMNs which were available and allowable, but an LR failure made registration on those PLMNs unsuccessful or an entry in a forbidden LAI list prevented a registration attempt, the MS selects the first such PLMN again and enters a limited service state.

~~B)~~4.4.3.1.2 Manual Network Selection Mode Procedure

The MS indicates whether there are any PLMNs, ~~in all of its bands of operation,~~ which are available using all supported access technologies. This includes "Forbidden PLMNs" and PLMNs which only offer services not supported by the MS. An MS which supports GSM COMPACT shall also indicate GSM COMPACT PLMNs (which use PBCCH). ~~Any PLMN shall only be presented once.~~.

If displayed, PLMNs meeting the criteria above are presented in the following order:

i) HPLMN;

ii) ~~ii)~~ PLMNs contained in the "User Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iii) PLMNs contained in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iv) ~~other PLMNs~~ other PLMN/access technology combinations with received high quality signal in random order;

v) ~~all other~~ other PLMN/access technology combinations ~~PLMNs~~ in order of decreasing signal quality.

~~iii) other PLMNs with received high quality signal in random order;~~

~~iv) all other PLMNs in order of decreasing signal quality.~~

In GSM or GSM COMPACT, if a PLMN does not support voice services then this shall be indicated to the user.

The user may select his desired PLMN and the MS then initiates registration on this PLMN using the access technology chosen by the user for that PLMN or using the highest priority available access technology for that PLMN, if the associated access technologies have a priority order. (This may take place at any time during the presentation of PLMNs). For such a registration, the MS shall ignore the contents of the forbidden LAI and PLMN lists.

NOTE: It is an MS implementation option whether to indicate access technologies to the user. If the MS does display access technologies, then the access technology used should be the access technology chosen by the user for that PLMN. If the MS does not display access technologies, then the access technology chosen for a particular PLMN should be the highest priority available access technology for that PLMN, if the associated access technologies have a priority order.

If the user does not select a PLMN, the selected PLMN shall be the one that was selected before the PLMN selection procedure started. If no such PLMN was selected or that PLMN is no longer available, then the MS shall attempt to camp on any acceptable cell and enter the limited service state.

~~NOTE 4: The scan in manual network selection mode includes PLMNs having cells with CELL_BAR_QUALIFY_2 transmitted and cells with CPBCCHs.~~

NOTE ~~5~~: High quality signal is defined in the appropriate AS specification.

4.4.3.2 User reselection

At any time the user may request the MS to initiate reselection and registration onto an available PLMN, according to the following procedures, dependent upon the operating mode.

~~A)~~4.4.3.2.1 Automatic Network Selection Mode

The MS selects and attempts registration on PLMNs, if available and allowable, in all of its bands of operation in accordance with the following order:

i) HPLMN;

ii) ~~ii)~~ PLMNs contained in the "User Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order) excluding the previously selected PLMN;

iii) PLMNs contained in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order) excluding the previously selected PLMN;

iv) ~~Other PLMNs~~ other PLMN/access technology combinations with the received high quality signal in random order excluding the previously selected PLMN;

v) ~~Any other PLMNs~~other PLMN/access technology combinations, excluding the previously selected PLMN in order of decreasing signal quality or, alternatively, the previously selected PLMN may be chosen ignoring its signal quality;

vi) The previously selected PLMN.

~~iii) Other PLMNs with the received high quality signal in random order excluding the previously selected PLMN;~~

~~iv) Any other PLMNs, excluding the previously selected PLMN in order of decreasing signal quality or, alternatively, the previously selected PLMN may be chosen ignoring its signal quality;~~

~~v)The previously selected PLMN.~~

The previously selected PLMN is the PLMN which the MS has selected prior to the start of the user reselection procedure.

NOTE: If the previously selected PLMN is chosen, and registration has not been attempted on any other PLMNs, then the MS is already registered on the PLMN, and so registration is not necessary.

When following the above procedure the ~~following~~ requirements a), b), c), e), f) in section 4.4.3.1.1 apply. Requirement d) shall apply as shown below:~~:~~

~~a) An MS with GSM voice capability shall ignore PLMNs for which the MS has identified at least one cell that transmits CELL_BAR_QUALIFY_2.~~

~~b) An MS with GSM voice capability shall not search for CPBCCH carriers.~~

~~c) In step i and ii, the MS should limit its search of network types to the one associated with the PLMN which it is attempting to select and register to (HPLMN or any PLMN on the PLMN selector). If a PLMN entry on the PLMN selector specifies more than one network type, the MS may scan for network types in the order of the time it takes to identify them (with the exception of requirement b), starting with the network type that takes the shortest time to identify.~~

d) In ~~step i~~v~~ii~~, ~~iv~~, and v~~i~~, the MS shall search for all ~~network typ~~access technologies it is capable of~~, with the exception of requirement b)~~, before deciding which PLMN to select.

~~e) A MS that does not have any stored network type information on the SIM shall first go through the steps by only searching for the BCCH network type. If no successful registration is achieved, then the COMPACT capable MS without GSM voice shall redo the procedure assuming that all PLMNs may be supporting all network types.~~

~~NOTE 6: Requirements a) and b) do not apply to MSs supporting GSM circuit switched data without supporting GSM voice.The previously selected PLMN is the PLMN which the MS has selected prior to the start of the user reselection procedure~~

NOTE ~~7~~: High quality signal is defined in the appropriate AS specification.

4.4.3.2.2~~B)~~ Manual Network Selection Mode

The Manual Network Selection Mode Procedure of subclause 4.4.3.1.2 is followed.

4.4.3.3 In VPLMN of home country

The MS shall periodically attempt to obtain service on its HPLMN by scanning in accordance with the requirements that are applicable to ~~step~~ i) as defined in the Automatic Network Selection Mode in clause 4.4.3.1.1. For this purpose, a value T minutes may be stored in the SIM, T is either in the range 6 minutes to 8 hours in 6 minute steps or it indicates that no periodic attempts shall be made. If no value is stored in the SIM, a default value of 30 minutes is used.

The attempts to access the HPLMN shall be as specified below:

a) The periodic attempts shall only be performed in automatic mode when the MS is roaming in its home country;

b) After switch on, a period of at least 2 minutes and at most T minutes shall elapse before the first attempt is made;

c) The MS shall make an attempt if the MS is on the VPLMN at time T after the last attempt;

d) Periodic attempts shall only be performed by the MS while in idle mode;

e) If the HPLMN is not found, the MS shall remain on the VPLMN.

4.4.3.4 Investigation Scan for higher prioritized PLMN

The support of this procedure is mandatory if the ME supports GSM COMPACT and otherwise optional.

A-MS capable of both GSM voice and packet service shall, when indicated in the SIM, investigate if there is service from a higher prioritized PLMN not offering GSM voice service, either HPLMN or a PLMN in ~~the~~ a "PLMN Selector with Access Technology" data field o~~i~~n the SIM.

The MS shall scan ~~shall~~ for PLMNs ~~be performed~~ in accordance with the requirements described for automatic network selection mode in subclause 4.4.3.1.1 that are applicable to ~~step~~ i), ii) and ~~step~~ iii) with the exception of requirement a) and b) in subclause 4.4.3.1. Requirement a) and b) that are specified for automatic network selection mode in subclause 4.4.3.1 shall be ignored during the investigation scan.

If indicated on the SIM, the investigation scan shall be performed:

i) After each successful PLMN selection and registration is completed, when the MS is in idle mode. This investigation scan may rely on the information from the already performed PLMN selection and may not necessarily require a rescan

ii) When the MS is unable to obtain normal service from a PLMN, (limited service state) see subclause 3.5.

The investigation scan is restricted to automatic selection mode and shall only be performed by an MS that is capable of both voice and packet data. It shall only be performed if the selected PLMN is not already the highest prioritized PLMN in the current country. (HPLMN in home country, otherwise according to PLMN selector lists)

The MS shall return to RPLMN after the investigation scan is performed.

If a higher prioritized PLMN not offering GSM voice service is found, this shall be indicated to the user. The MS shall not select the PLMN unless requested by the user.

~~The investigation scan for higher prioritized PLMN shall be as specified below:~~

~~a) The scan shall only be performed in automatic network selection mode;~~

~~b) The scan shall only be performed by an MS that is capable of both voice and packet;~~

~~c) The scan shall only be performed if the serving PLMN is not the highest prioritized PLMN in the current country (HPLMN in home country, otherwise according to the PLMN selector list);~~

~~d) The scan shall be performed at least once after a successful PLMN selection is completed;~~

~~e) The investigation scan should be performed when the MS enters idle mode;~~

~~The MS shall return to RPLMN after the investigation scan is performed.~~

~~Note: The MS remains on the RPLMN independent of the outcome of the investigation scan. The purpose of the investigation scan is to check if there is a higher prioritized PLMN, not to select it.~~

4.4.4 Abnormal cases

If there is no SIM in the MS, if there is an authentication failure, or if the MS receives an "IMSI unknown in HLR", "illegal ME" or "illegal MS" response to an LR request, then effectively there is no selected PLMN ("No SIM" state). In these cases, the states of the cell selection process are such that no PLMN selection information is used. No further attempts at registration on any PLMN are made until the MS is switched off and on again, or a SIM is inserted.

When in Automatic Network Selection mode and the MS is in the "not updated" state with one or more suitable cells to camp on; then after the maximum allowed unsuccessful LR requests (controlled by the specific attempt counters) the MS may continue (or start if it is not running) the user reselection procedure of 4.4.3.2.1 ~~A~~.

4.4.5 Roaming not allowed in this LA

If in either PLMN selection mode the LR response "Roaming not allowed in this LA" is received:

The PLMN Automatic or Manual Mode Selection Procedure of subclause 4.4.3.1 are followed, depending on whether the MS is in automatic or manual mode. (This requirement applies to all MSs.)

***** Next modified section *****

4.5.2 Initiation of Location Registration

An LR request indicating Normal Updating is made when, in idle mode,

- the MS changes cell while being in the update state NOT UPDATED; (for MS capable of GPRS and non-GPRS services when at least one of both update states is NOT UPDATED)
- the MS detects that it has entered a new registration area, i.e., when the received registration area identity differs from the one stored in the MS, and the LAI or the PLMN identity is not contained in a list of forbidden LAIs or PLMN identities respectively, while being in one of the following update states:
  - UPDATED;
  - NOT UPDATED;
  - ROAMING NOT ALLOWED.
- the Periodic Location Updating Timer expires while being in the non-GPRS update state NOT UPDATED (triggers Location Updating);
- the Periodic Routing Area Update timer expires while being in the GPRS update state NOT UPDATED (triggers Routing Area Update);
- a manual network reselection has been performed, an acceptable cell of the selected PLMN is present, and the MS is not in the UPDATED state on the selected PLMN.

An LR request indicating Periodic Location Updating is made when, in idle mode, the Periodic Location Updating timer expires while being in the non-GPRS update state UPDATED.

An LR request indicating Periodic Routing Area Update is made when the Periodic Routing Area Update timer expires while being in the GPRS update state UPDATED.

An LR request indicating IMSI attach is made when the MS is activated in the same location area in which it was deactivated while being in the non-GPRS update state UPDATED, and the system information indicates that IMSI attach/detach shall be used.

A GPRS attach is made by a GPRS MS when activated and capable of services which require registration. Depending on system information about GPRS network operation mode MSs capable of GPRS and non-GPRS services perform combined or non-combined location registration procedures. When the combined routing area update or GPRS attach is accepted with indication "MSC not reachable“ or is not answered the MS performs also the corresponding location updating procedure or falls back to a GPRS only MS. When the combined routing area update or GPRS attach is rejected with cause "GPRS not allowed“ the GPRS update state is "IDLE, NO IMSI“ and the MS performs the corresponding location updating procedure or falls back to a GPRS only MS.

Furthermore, an LR request indicating Normal Location Updating is also made when the response to an outgoing request shows that the MS is unknown in the VLR or SGSN, respectively.

Table 2 in clause 5 summarizes the events in each state that trigger a new LR request. The actions that may be taken while being in the various states are also outlined in table 2.

A GPRS MS which is both IMSI attached for GPRS and non-GPRS services and which is capable of simultaneous operation of GPRS and non-GPRS services shall perform Routing Area Update in connected mode when it has entered a new routing area which is not part of a LA contained in the list of forbidden LAIs.

***** Next modified section *****

4.6 Service indication (GSM only)

This is an indication to the user that service or CTS service is available.

The service indication should be set if the following conditions are all satisfied:

a) Cell Selection: Camped on a suitable cell and in updated state, or in connected mode having been camped on a suitable cell.

b) Location registration: In updated state, for MSs capable of services requiring registration.

A specific CTS service indication should be set when the CTS MS is attached to a CTS FP.

However due to the fact that there may be some transitory changes of state, the service indication is permitted to continue to be set for up to 10 seconds after the above conditions cease to be met. Also the service indication is permitted to take up to 1 second to be set after the above conditions are met.

4.7 Pageability of the mobile subscriber

An MS is required to listen to all paging messages that could address it (see GSM 05.02), when the following conditions are all satisfied:

- A SIM is inserted.
- The MS is camped on a cell.
- The MS is not in state "Idle, No IMSI".
- The MS is not performing the task to search for available PLMNs. (Whenever possible during this task, the MS should listen for paging.). However, when the MS is camped on a cell, is registered in a PLMN and is performing its regular search for the HPLMN, as specified in UMTS 22.011, then it shall listen to all paging messages that could address it.

NOTE 1: In GSM, during cell reselection there is a certain period when the MS is no longer camped on the old cell but must decode the full BCCH or CPBCCH before camping on the new cell. This leads to a period of slightly more than 8 51 frame multiframes when the MS will not necessarily be pageable.

5 Tables and Figures

Table 1: Effect of LR Outcomes on PLMN Registration

Location Registration Task State	Registration Status	Registered PLMN is
Updated	Successful	Indicated in the stored registration area identity
Idle, No IMSI	Unsuccessful	No registered PLMN (3)
Roaming not allowed:		
a) PLMN not allowed	Unsuccessful	No registered PLMN
b) LA not allowed	Indeterminate(1)	No registered PLMN
c) Roaming not allowed in this LA	Indeterminate (2)	No registered PLMN
Not updated	Unsuccessful	No registered PLMN

1) The MS will eventually either enter a different state when the registration status will be determined, or fail to be able to camp on a cell, when registration will be unsuccessful.

2) The MS will select the HPLMN if in automatic mode and will enter Automatic Network Selection Mode Procedure of subclause 4.4.3.1. If in manual mode, the MS will display the list of available PLMNs and follow the Manual Network Selection Mode Procedure of subclause 4.4.3.1.2 If the appropriate process does not result in registration, the MS will eventually enter the limited service state.

3) A MS may have different update states for GPRS and non-GPRS. A PLMN is registered when at least one of both update states is updated.

NOTE 1: MSs capable of GPRS and non-GPRS services may have different registration status for GPRS and for non-GPRS.

NOTE 2: The registered PLMN is determined by looking at the stored registration area identity and stored location registration status.