

3GPP TSG_CN#6

NP-99502

Nice, France

13th – 15th December 1999

Agenda item:

Source: TSG_N WG2

Title: CRs to GSM 09.02, 3G TS 29.002 (Work Item USSD)

Introduction:

This document contains **3** CRs on **Work Item USSD** agreed by **TSG_N WG2** and forwarded to **TSG_N Plenary** meeting #6 for approval.

TDoc	Spec	CR	Rev	Ph.	Cat	Old v.	New v.	Subject
N2-99G82	09.02	A236	1	R97	F	6.5..0	6.6.0	Correction of the USSD procedure in the HLR
N2-99K22	09.02	A277		R98	A	7.2.0	7.3.0	Correction of the USSD procedure in the HLR
N2-99K24	29.002	069		R99	A	3.2.0	3.3.0	Correction of the USSD procedure in the HLR

CHANGE REQUEST No : A236r1			
Technical Specification GSM 09.02		Version: 6.4.0	
Submitted to TSG CN#06	for approval X	without presentation ("non-strategic") X	
<small>list SMG plenary meeting no. here ↑</small>	for information	with presentation ("strategic")	
<small>PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip</small>			

Proposed change affects: SIM ME Network
(at least one should be marked with an X)

Work item: USSD

Source: TSG N2 **Date:** 5 Nov 1999

Subject: Correction of the USSD procedure in the HLR.

Category:	F Correction <input checked="" type="checkbox"/>	Release:	Phase 2 <input type="checkbox"/>
<small>(one category and one release only shall be marked with an X)</small>	A Corresponds to a correction in an earlier release <input type="checkbox"/>		Release 96 <input type="checkbox"/>
	B Addition of feature <input type="checkbox"/>		Release 97 <input checked="" type="checkbox"/>
	C Functional modification of feature <input type="checkbox"/>		Release 98 <input type="checkbox"/>
	D Editorial modification <input type="checkbox"/>		Release 99 <input type="checkbox"/>
			UMTS <input type="checkbox"/>

Reason for change: Category C1: Essential Correction because the USSD procedures between the HLR and gsmSCF are not specified appropriately in MAP.

The applicability of the USSD functionality was extended to incorporate the gsmSCF in GSM release 97. However, GSM 09.02 has only partially been updated to reflect this.

This change requests proposes the modification of the text describing the "Procedure in the HLR" to include reference to the gsmSCF.

Clauses affected: 22.9.4 & 22.10.4, 22.11.2

Other specs affected:	Other releases of same spec <input checked="" type="checkbox"/>	→ List of CRs: CR09.02-A277, 29.002-A069
	Other core specifications <input type="checkbox"/>	→ List of CRs:
	MS test specifications / TBRs <input type="checkbox"/>	→ List of CRs:
	BSS test specifications <input type="checkbox"/>	→ List of CRs:
	O&M specifications <input type="checkbox"/>	→ List of CRs:

Other comments:

22.9.4 Procedures in the HLR

The initiation of the process is shown in subclause 22.1.3.

Once a MAP dialogue is established, the HLR may handle the MAP_PROCESS_UNSTRUCTURED_SS_REQUEST from the VLR. This message contains information input by the user. If the alphabet used for the message is understood then the message shall either be fed to an application contained locally in the HLR or to the gsmSCF. If the alphabet is not understood then the error "UnknownAlphabet" shall be returned.

Message Destined for Local Application

If the message is destined for the local USSD application then the HLR shall transfer the message to the local application.

The HLR may subsequently receive one or more requests from the application which correspond to the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY indications. These shall be sent transparently to the VLR. When a confirmation is received from the VLR this shall be returned to the application.

When the HLR receives the result of the original operation from the application then it shall pass this to the VLR and initiate release of the CM connection.

Message Destined for gsmSCF

If the message is destined for the gsmSCF then the HLR shall transfer the message transparently to the gsmSCF.

The HLR may subsequently receive one or more MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY indications from the gsmSCF. These shall be sent transparently to the VLR. When a confirmation is received from the VLR this shall be returned to the gsmSCF.

When the HLR receives a MAP_PROCESS_UNSTRUCTURED_SS_REQUEST confirmation from the gsmSCF then it shall pass this to the VLR and closes the MAP provider service.

Error Handling

Both the VLR, the USSD Application and the gsmSCF may initiate release of the MAP service at any time. This is handled as shown in the diagrams.

The procedure in the HLR is shown in figure 22.9.4/1.

Process MS_INIT_USSD_HLR

22.9.4_1.1(2)

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR unless otherwise stated.

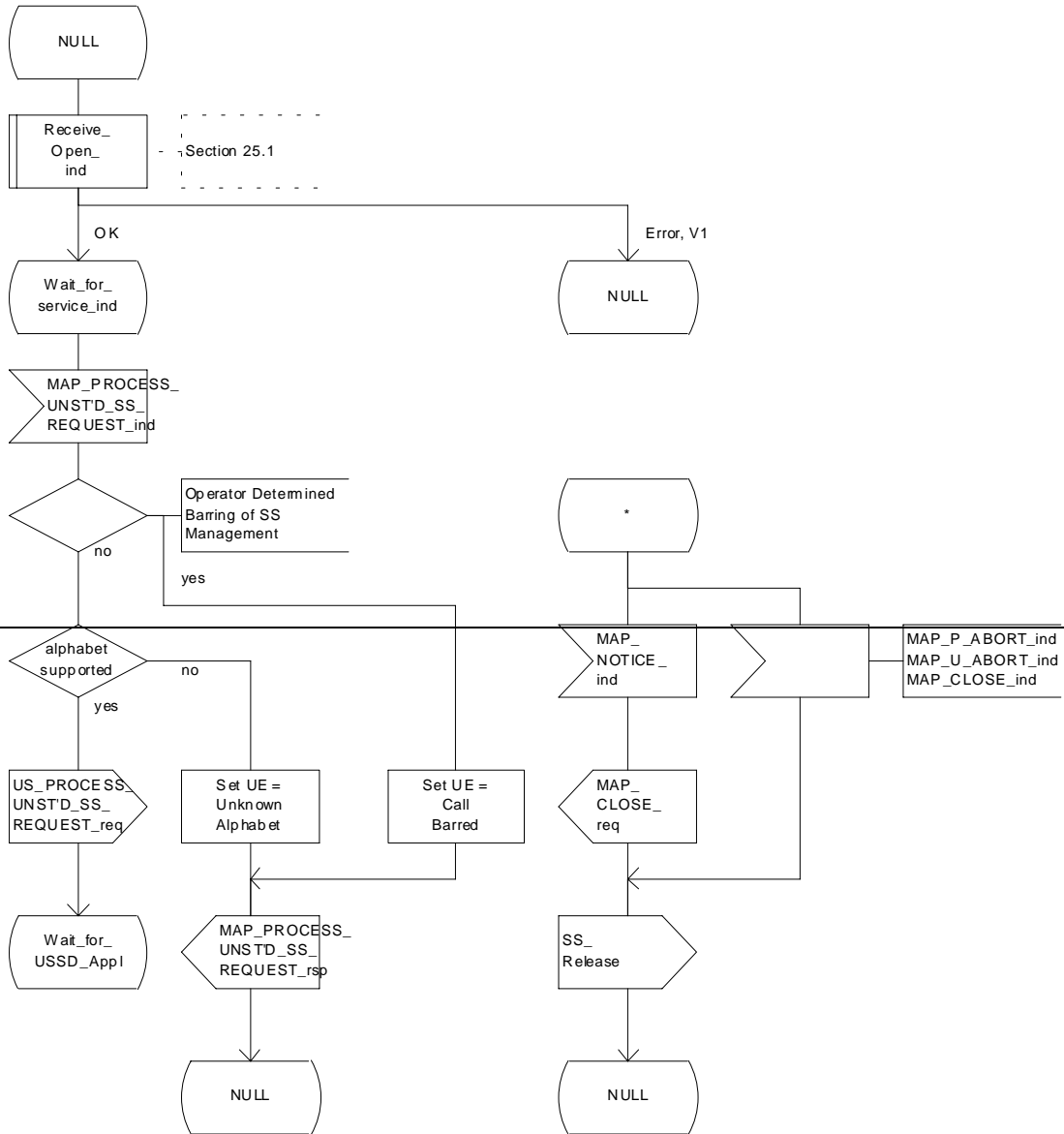


Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR unless otherwise stated.
 Arrow to right are to USSD application unless otherwise stated

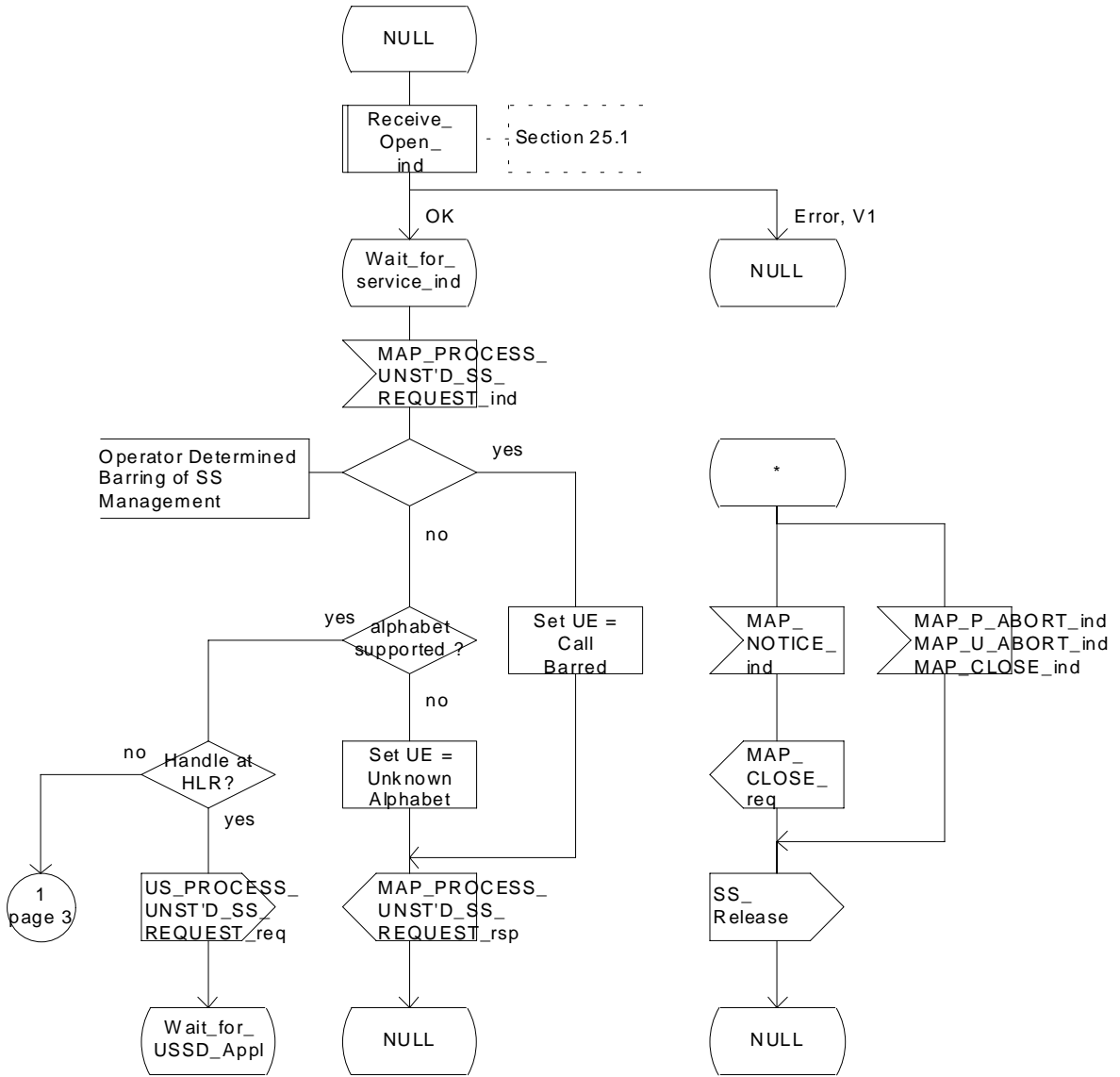


Figure 22.9.4/1 (sheet 1 of 24): Procedure MI_USSD_HLR

Process MS_INIT_USSD_HLR

22.9.4_1.2(2)

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

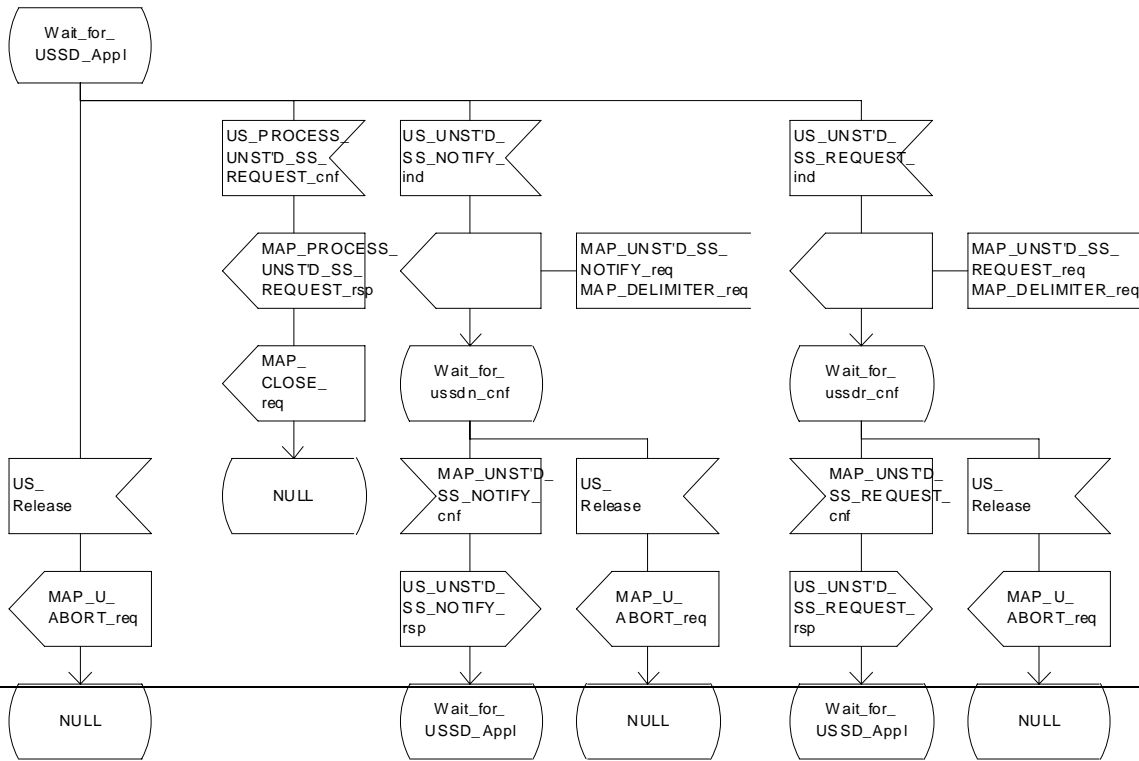


Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

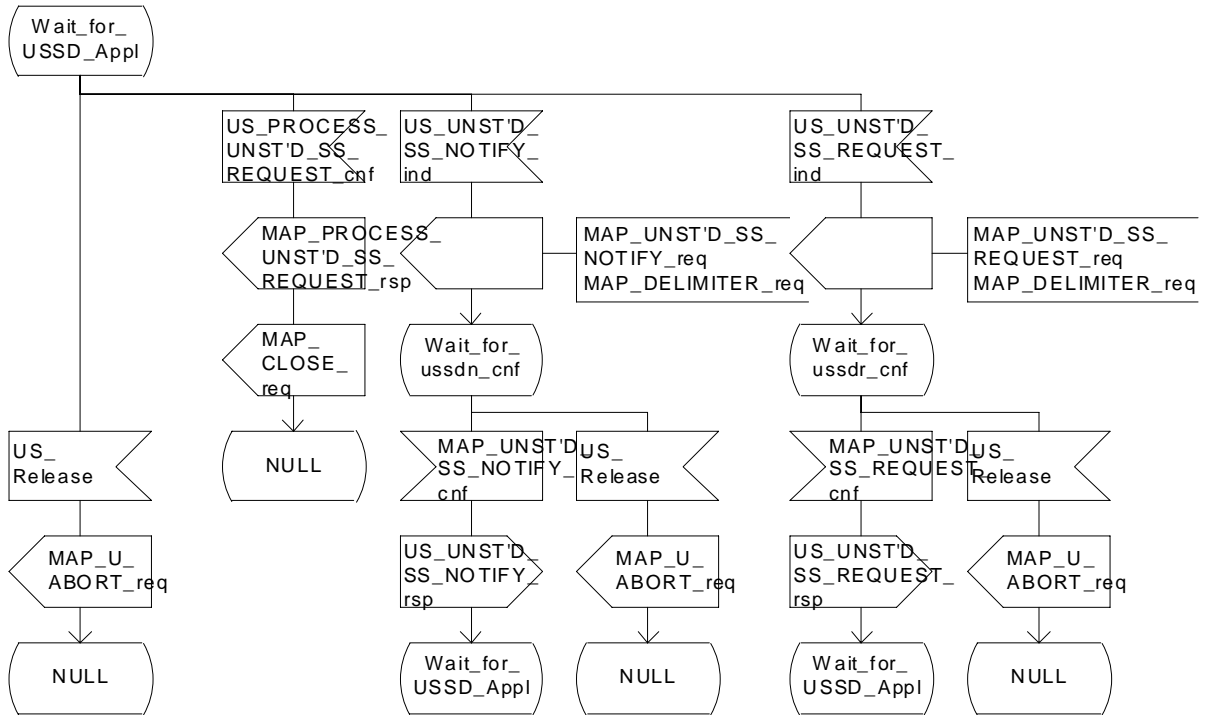


Figure 22.9.4/1 (sheet 2 of 24): Procedure MI_USSD_HLR

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to gsmSCF unless otherwise stated.

Section 22.11

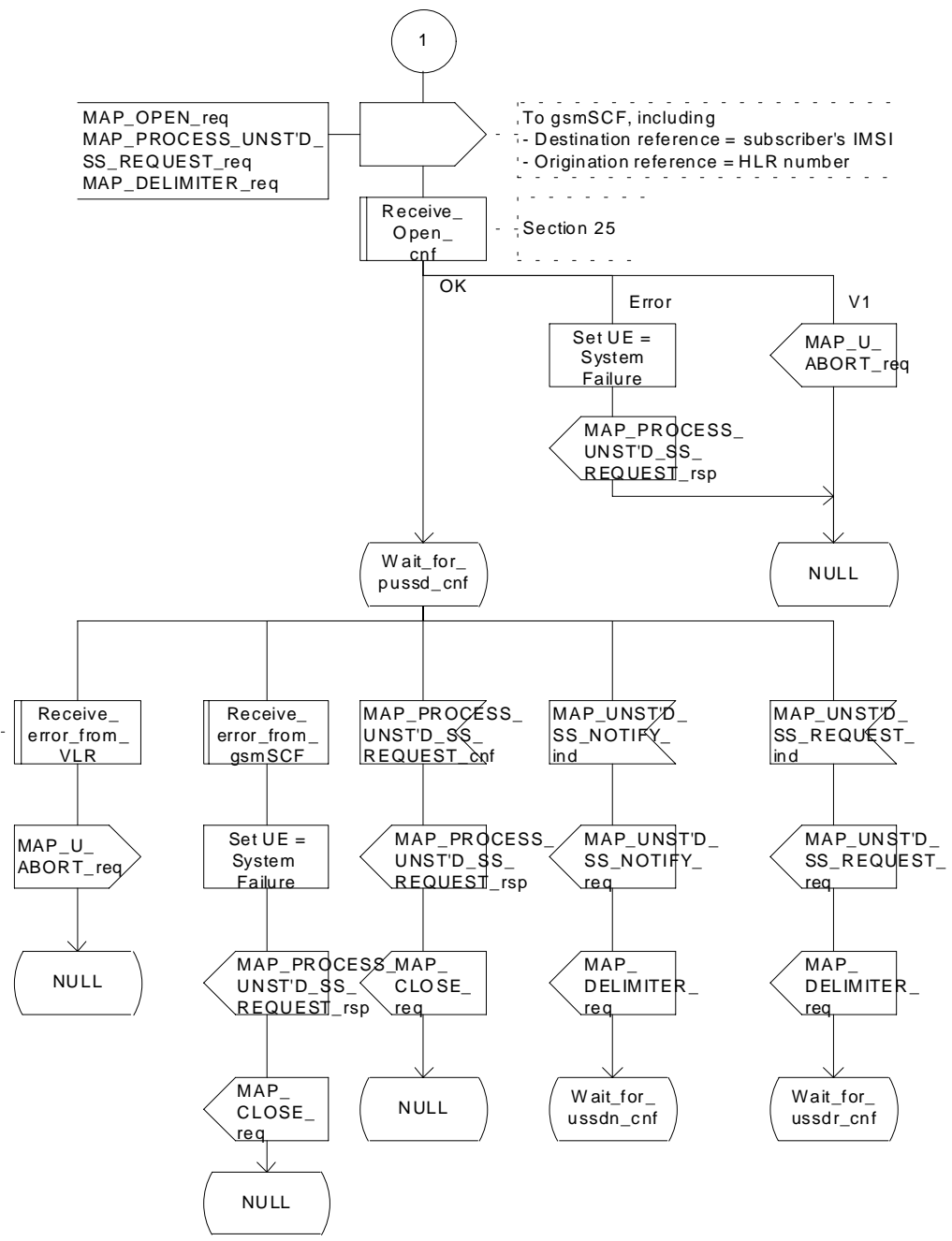


Figure 22.9.4/1 (sheet 3 of 4): Procedure MI USSD HLR

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

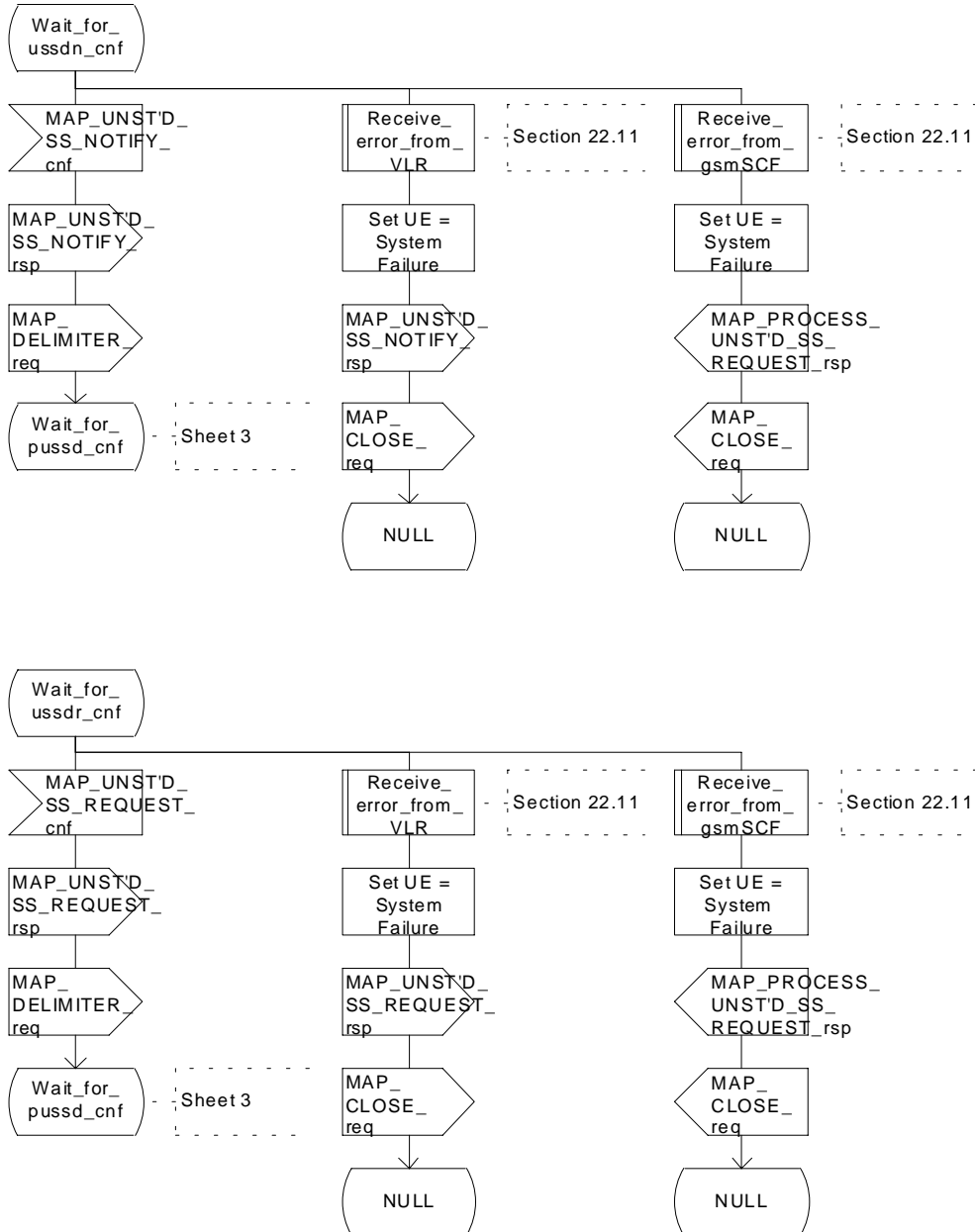


Figure 22.9.4/1 (sheet 4 of 4): Procedure MI USSD HLR

22.10.4 Procedure in the HLR

The procedure may be invoked either by the gsmSCF or by a USSD application local to the HLR. It may start by using either the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY service.

In both cases the HLR will first check whether the MS is reachable (~~i.e. there is a VLR identity stored in the subscriber record, the MS record is not marked as purged and the MS record is not marked "MSC Area Restricted"~~).

If the MS is reachable, the HLR will initiate a MAP dialogue with the VLR. Once the dialogue is successfully established the message received from the gsmSCF or USSD application will be sent to the MSCVLR.

Following transfer of the message the HLR will wait for a confirmation from the MSCVLR. This will be sent to the gsmSCF or USSD application as appropriate.

Following this, the HLR may receive further uses of the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY services, or may receive a MAP_CLOSE_ind.

In the event of an error, the MAP process with the VLR shall be released and if necessary the MAP process with the gsmSCF shall be aborted, as shown in the diagram.

Message Originated by gsmSCF

If the message is originated by the gsmSCF then the HLR shall transfer the message transparently to the VLR.

The HLR may subsequently receive one or more MAP_UNSTRUCTURED_SS_REQUEST_ind or MAP_UNSTRUCTURED_SS_NOTIFY_ind indications from the ~~VLR~~gsmSCF. These shall be sent transparently to the ~~gsmSCF~~VLR. When a confirmation is received from the ~~gsmSCF~~VLR this shall be returned to the ~~VLR~~gsmSCF.

When the HLR receives a MAP_CLOSE_ind from the gsmSCF then it shall pass this to the VLR and close the MAP dialogue.

The procedure in the HLR is shown in figure 22.10.4/1 and 22.10.4/2.

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR,
Arrows to right are to gsmSCF
unless otherwise stated.

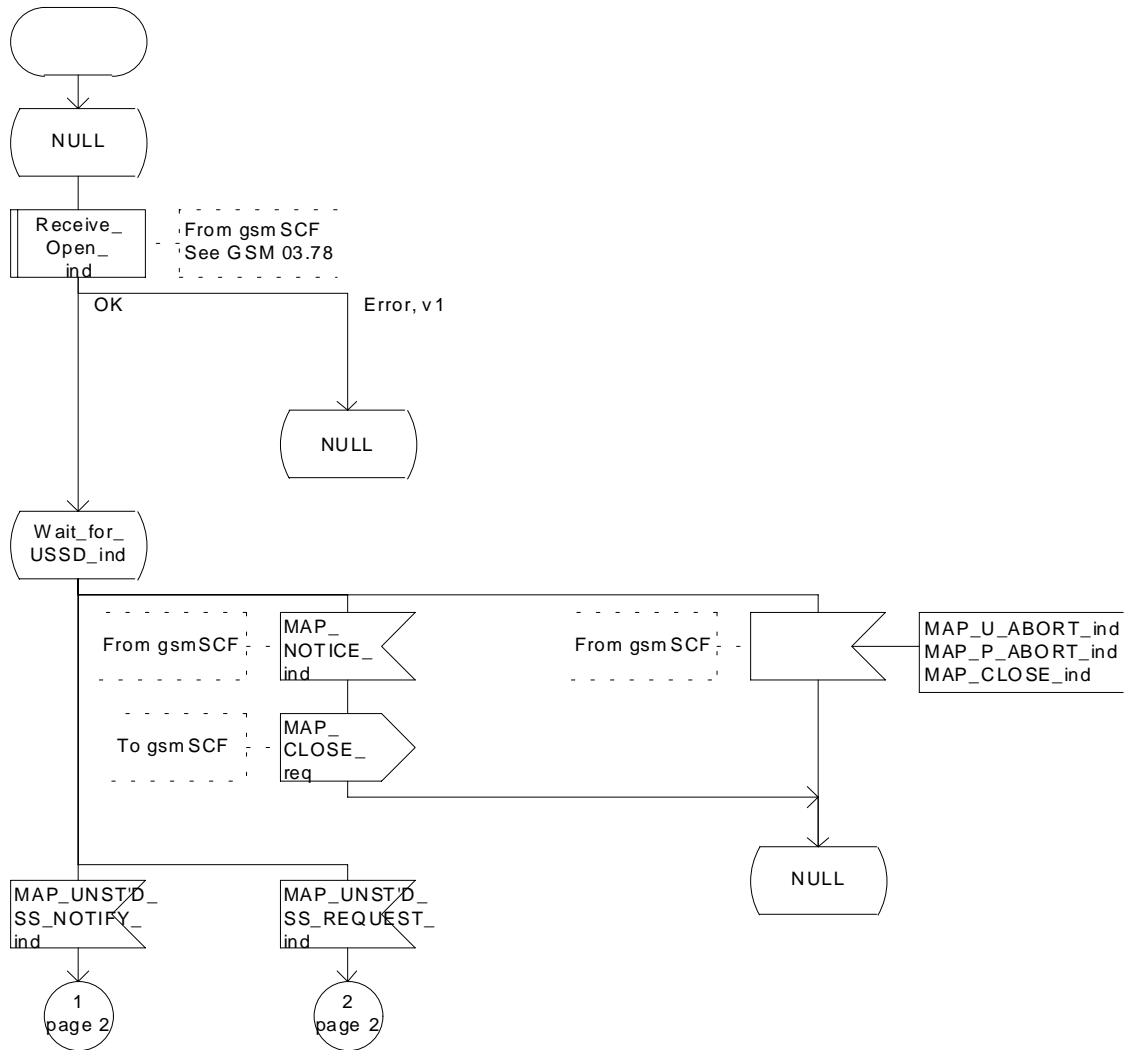


Figure 22.10.4/1 (sheet 1 of 5): Procedure NI_USSD_HLR

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR,
Arrows to right are to gsm SCF
unless otherwise stated.

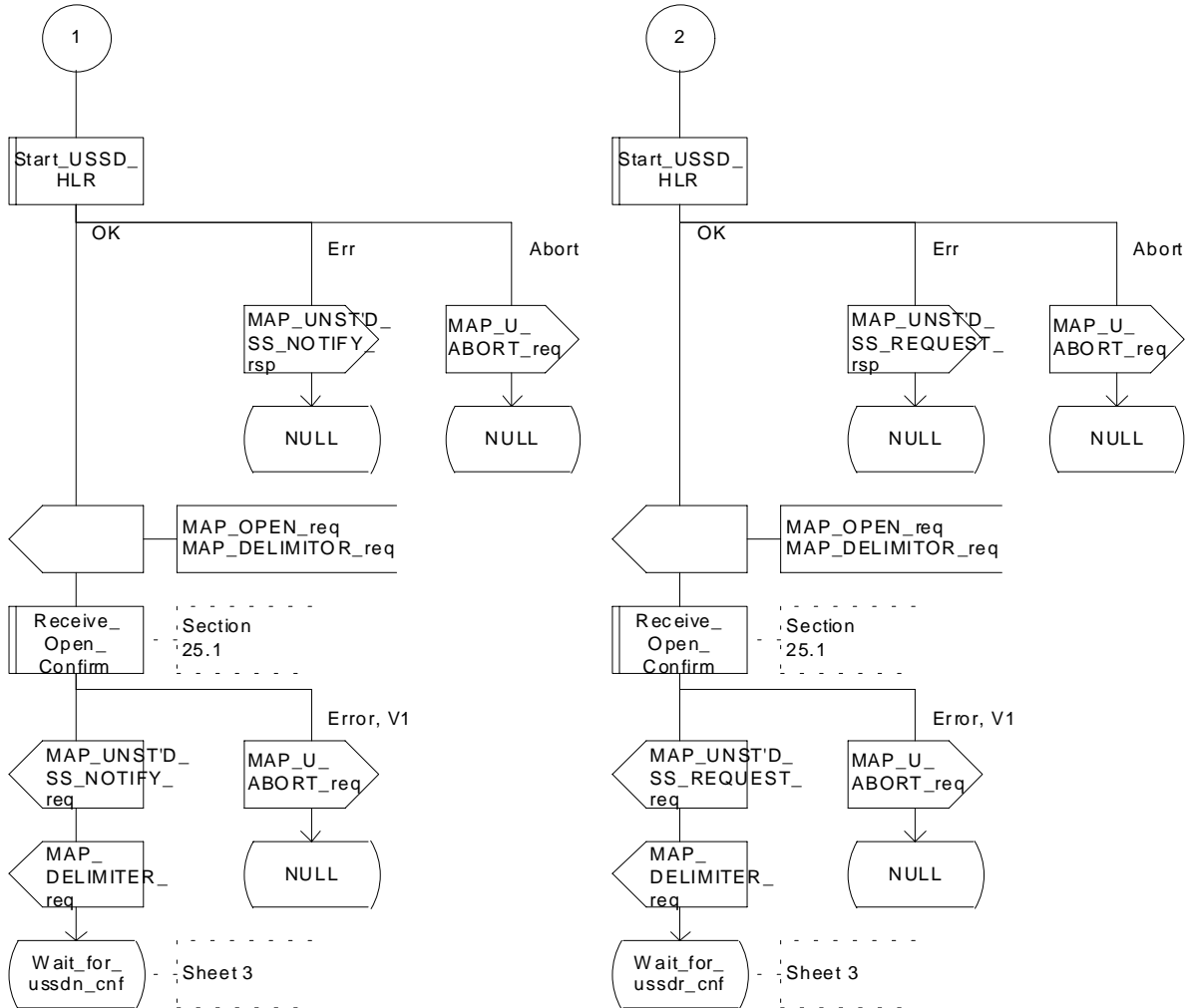


Figure 22.10.4/1 (sheet 2 of 5): Procedure NI_USSD_HLR

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR,
Arrows to right are to gsmSCF
unless otherwise stated.

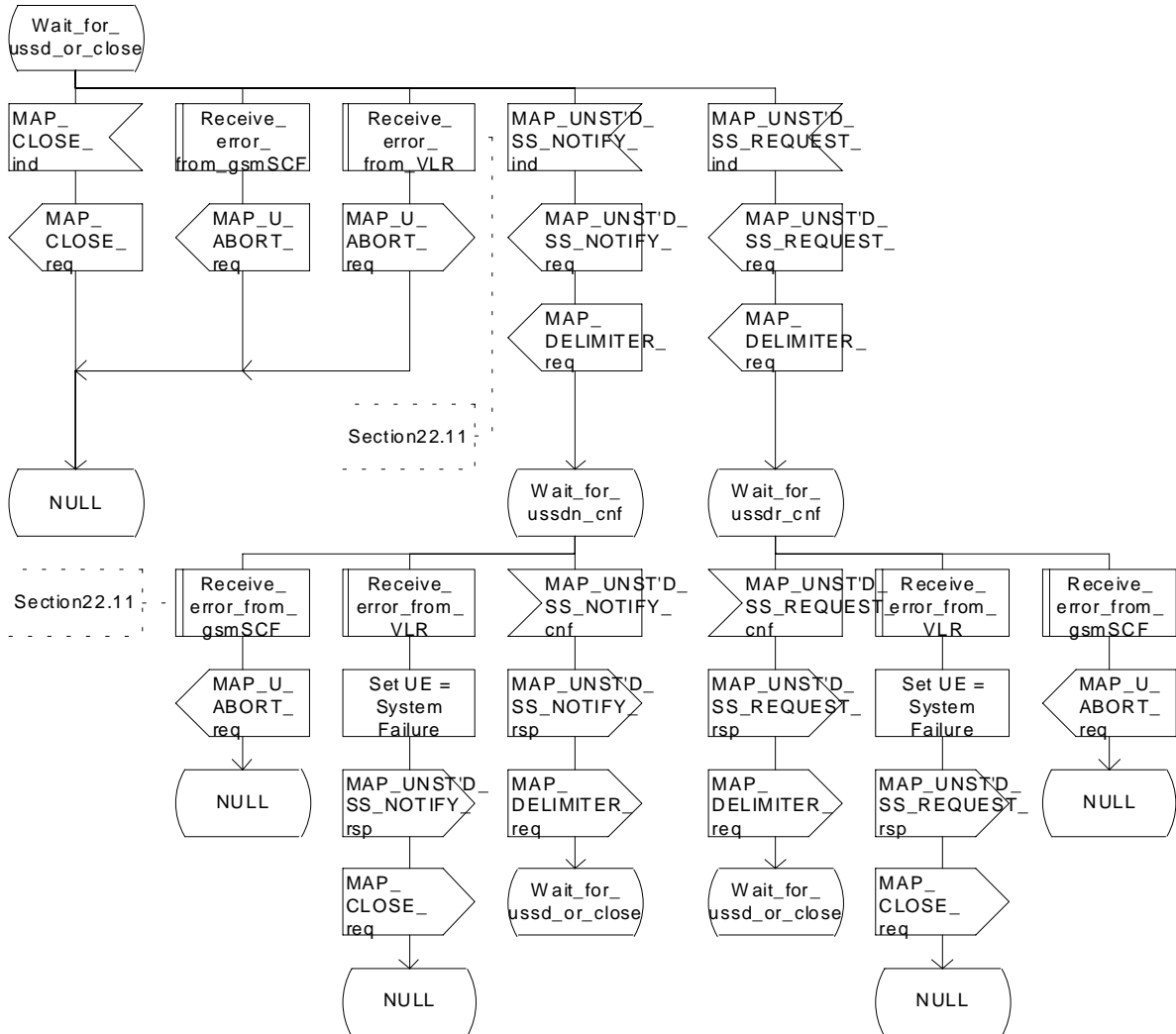


Figure 22.10.4/1 (sheet 3 of 5): Procedure NI USSD HLR

Process NW_INIT_USSD_HLR

22.10.4_1.1(2)

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

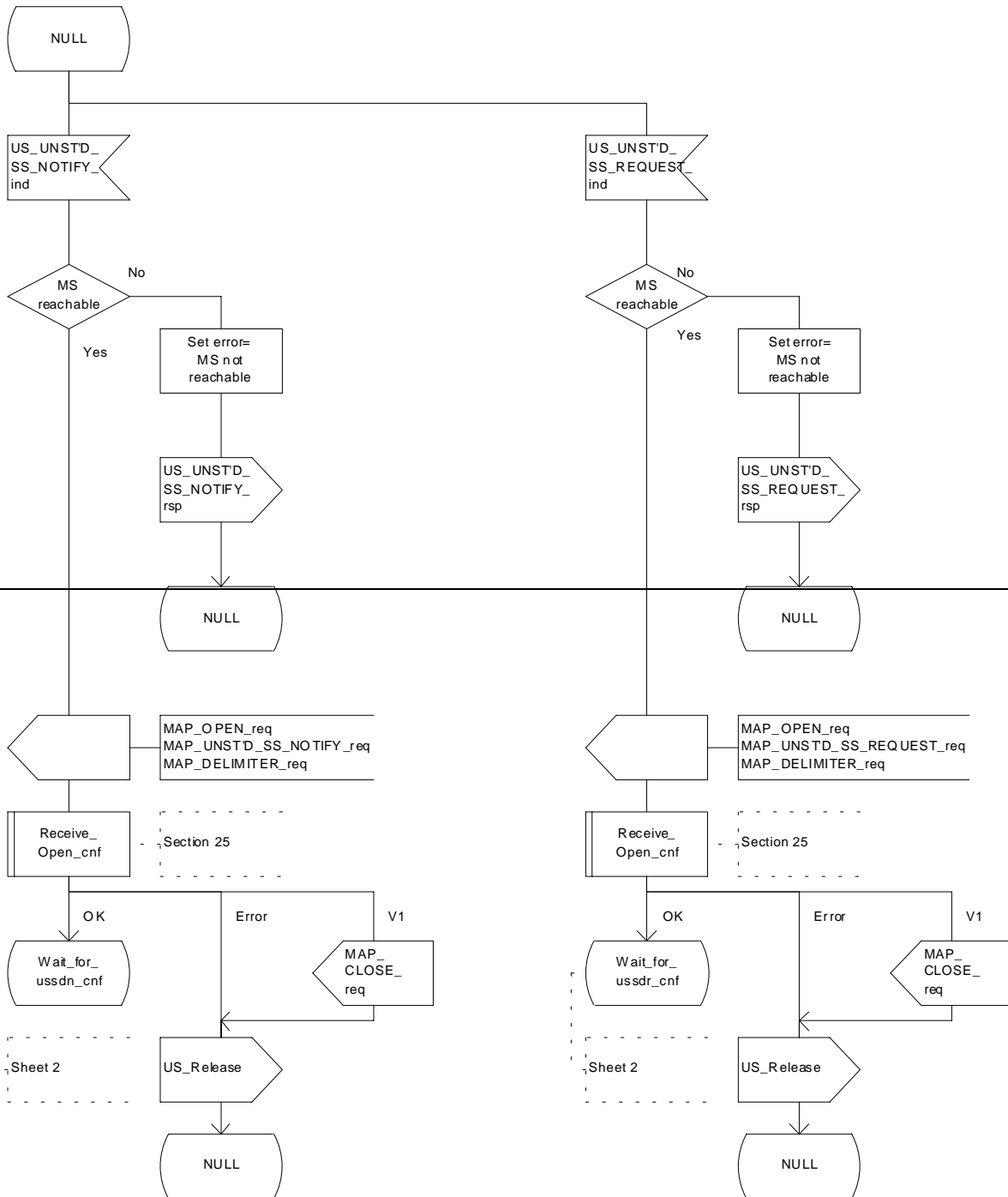


Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

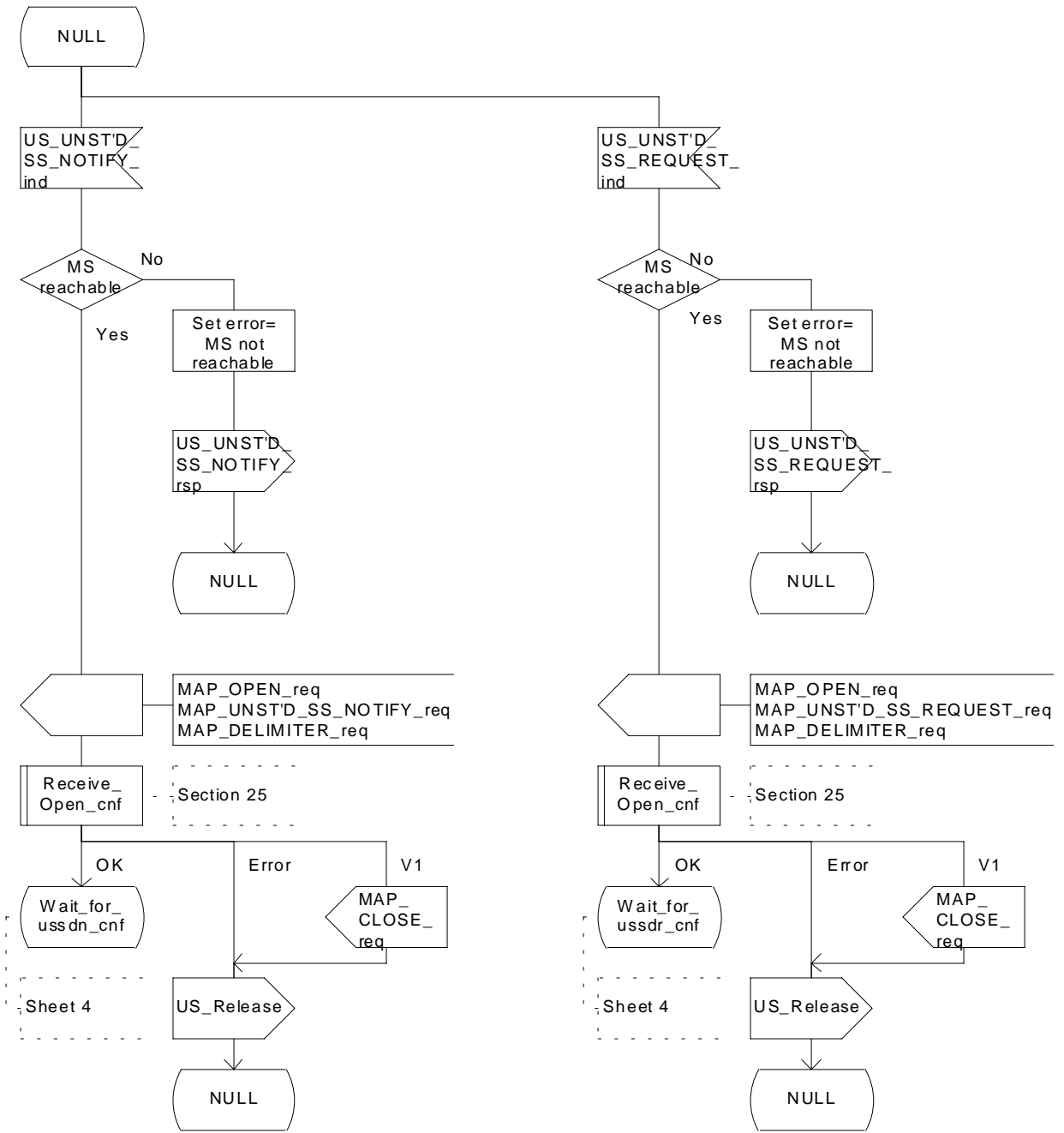


Figure 22.10.4/1 (sheet 41 of 52): Procedure NI_USSD_HLR

Process NW_INIT_USSD_HLR

22.10.4_1.2(2)

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

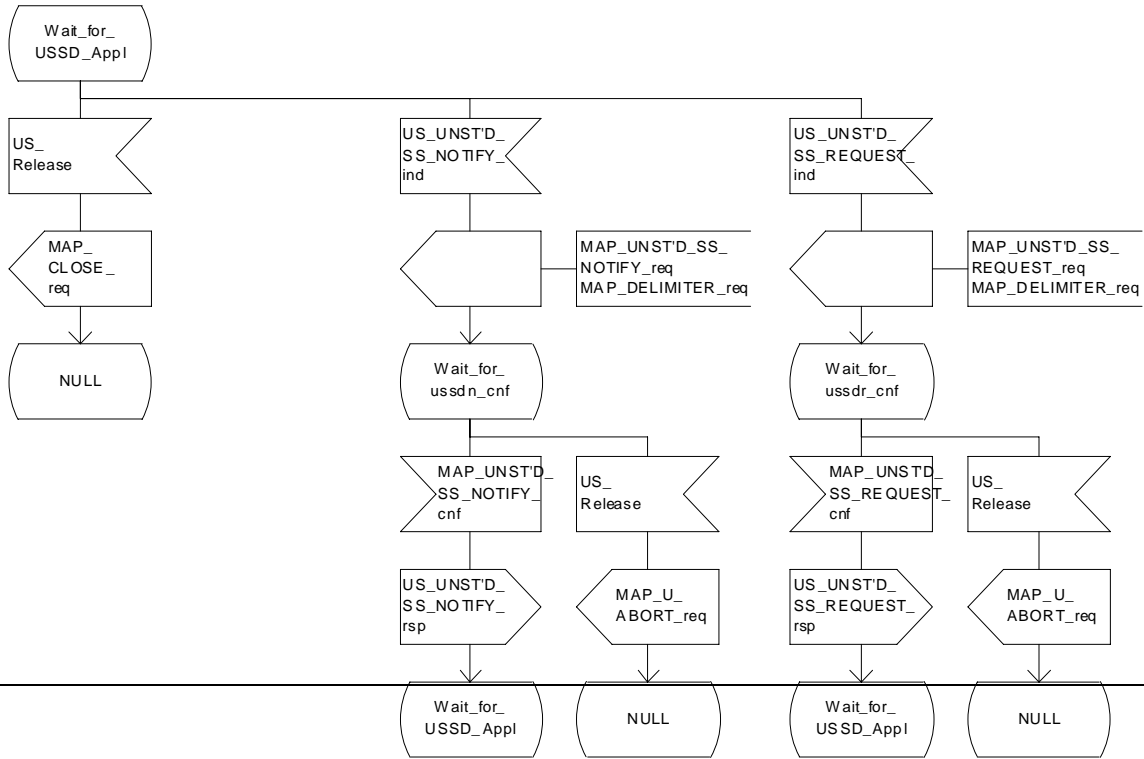


Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

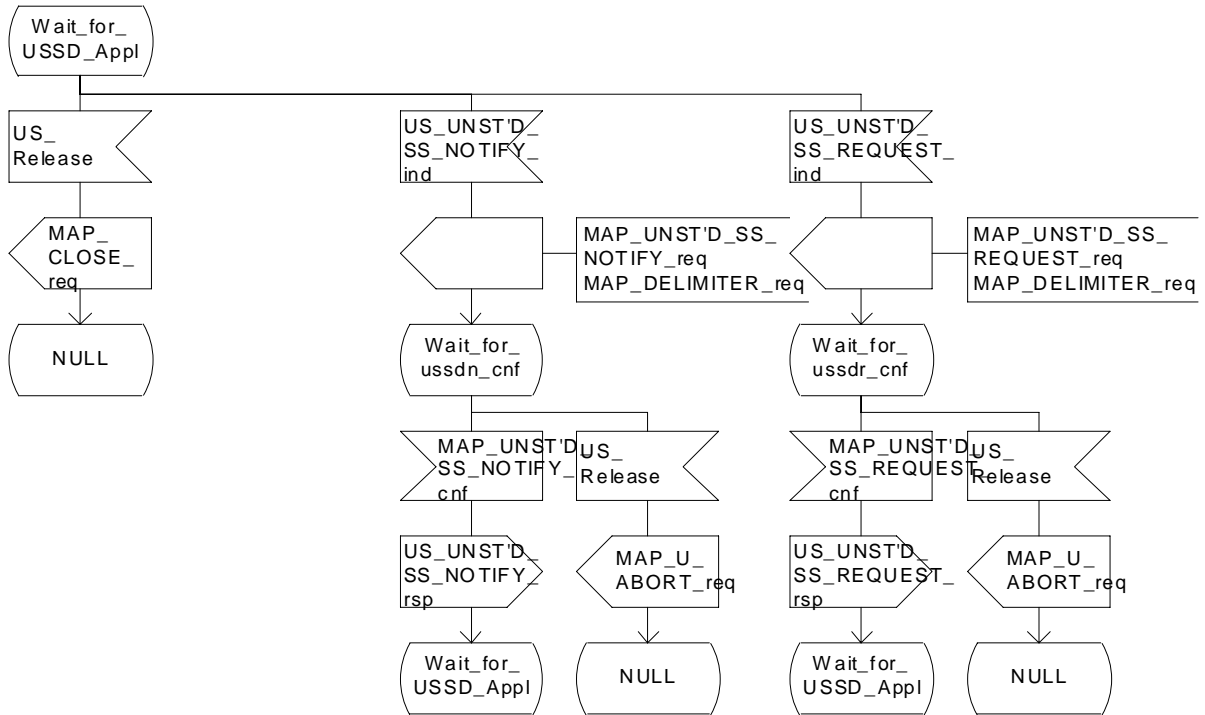


Figure 22.10.4/1 (sheet 52 of 52): Procedure NI_USSD_HLR

Figure 22.10.4/2: Macro to check MS is reachable at the HLR for a network initiated USSD operation.

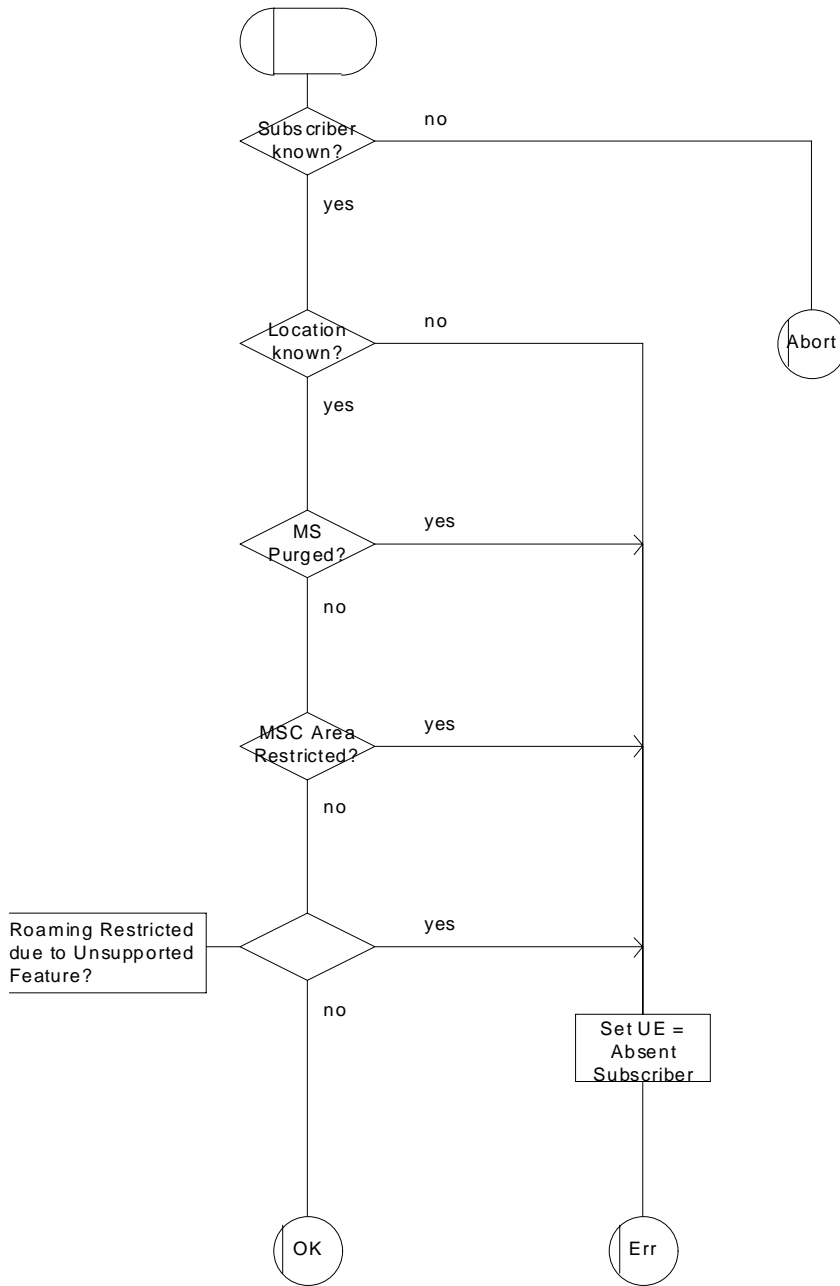


Figure 22.10.4/2: Macro Start USSD HLR

*** Next Modified Section ***

22.11.2 SS Error handling macros

Macro Receive_errors_MSC

This macro is used by the MSC to receive signals which should lead to failure if received in any state of a supplementary service process. If the air interface connection is released by the MS, the communication towards the VLR is aborted, and the MSC should return to a stable "NULL" state. If a MAP_NOTICE indication is received from the VLR, or the VLR aborts or unexpectedly closes the connection, then the air interface connection shall be released. The macro is described in figure 22.11.2/1.

Macro Receive_error_from_MSC

This macro is used by the VLR to receive signals from the MSC which should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the MSC, that connection is closed before the only outcome of the macro, "err" is reported back to the calling process. The macro is described in figure 22.11.2/2.

Macro Receive_error_from_HLR

This macro is used by the VLR to receive signals from the HLR which should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the ~~MSC~~HLR, that connection is closed. The macro is described in figure 22.11.2/3.

Macro Receive error from VLR

This macro is used by the HLR to receive signals from the VLR that should lead to failure if received in any state of a supplementary service process. If a MAP NOTICE indication is received from the VLR, that connection is closed before the only outcome of the macro, "err" is reported back to the calling process. The macro is described in figure 22.11.2/4.

Macro Receive error from gsmSCF

This macro is used by the HLR to receive signals from the gsmSCF that should lead to failure if received in any state of a supplementary service process. If a MAP NOTICE indication is received from the gsmSCF, that connection is closed. The macro is described in figure 22.11.2/5.

*** New SDLs ***

Figure 22.11.2/4: Macro to receive errors from the VLR during supplementary services procedures in the HLR

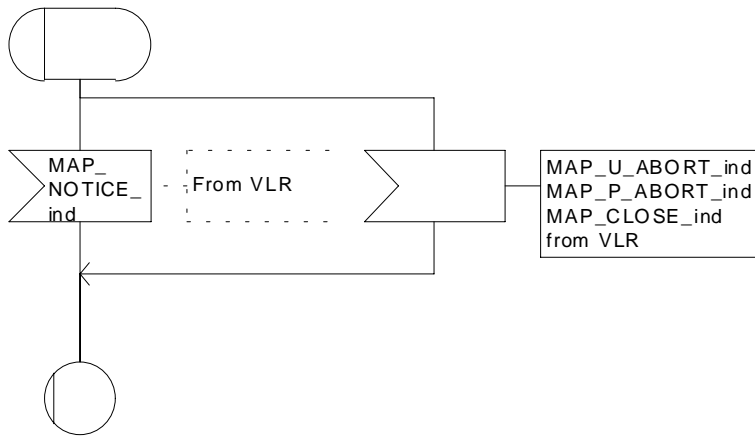


Figure 22.11.2/4: Macro Receive error from VLR

Macrodefinition Receive_error_from_gsmSCF

22.11.2_5(1)

Figure 22.11.2/5: Macro to receive errors from the gsmSCF while the HLR is waiting for a confirmation of a supplementary service request sent to the gsmSCF

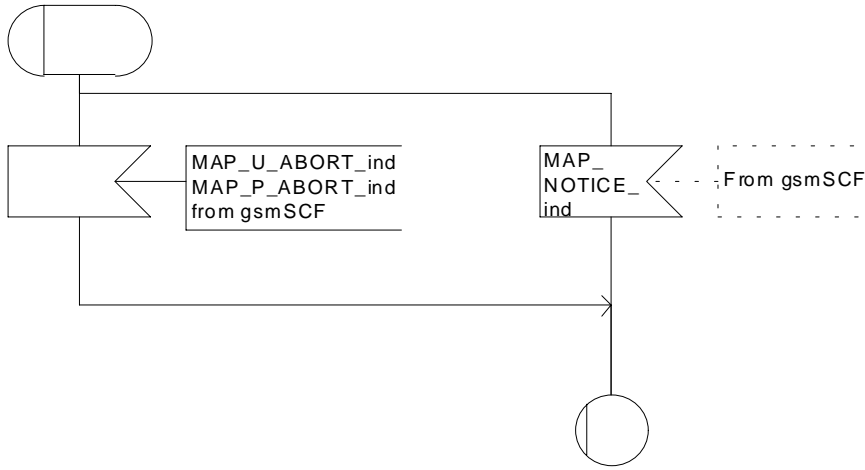


Figure 22.11.2/5: Macro Receive error from gsmSCF

CHANGE REQUEST No : A277			
Technical Specification GSM 09.02		Version: 7.2.0	
Submitted to TSG CN#06	for approval <input checked="" type="checkbox"/>	without presentation ("non-strategic") <input checked="" type="checkbox"/>	
<small>list SMG plenary meeting no. here ↑</small>	for information <input type="checkbox"/>	with presentation ("strategic") <input type="checkbox"/>	
<i>PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip</i>			

Proposed change affects: SIM ME Network
(at least one should be marked with an X)

Work item: USSD

Source: TSG N2 **Date:** 18 Nov 1999

Subject: Correction of the USSD procedure in the HLR.

Category:	F Correction <input type="checkbox"/> A Corresponds to a correction in an earlier release <input checked="" type="checkbox"/> B Addition of feature <input type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	Release:	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input checked="" type="checkbox"/> Release 99 <input type="checkbox"/> UMTS <input type="checkbox"/>
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(one category and one release only shall be marked with an X)

Reason for change: Category C1: Essential Correction because the USSD procedures between the HLR and gsmSCF are not specified appropriately in MAP.

The applicability of the USSD functionality was extended to incorporate the gsmSCF in GSM release 97. However, GSM 09.02 has only partially been updated to reflect this.

This change requests proposes the modification of the text describing the "Procedure in the HLR" to include reference to the gsmSCF.

Clauses affected: 22.9.4 & 22.10.4, 22.11.2

Other specs affected:	Other releases of same spec <input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> MS test specifications / TBRs <input type="checkbox"/> BSS test specifications <input type="checkbox"/> O&M specifications <input type="checkbox"/>	→ List of CRs: CR09.02-A237r1, 29.002-A069 → List of CRs: → List of CRs: → List of CRs: → List of CRs:
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Other comments:

22.9.4 Procedures in the HLR

The initiation of the process is shown in subclause 22.1.3.

Once a MAP dialogue is established, the HLR may handle the MAP_PROCESS_UNSTRUCTURED_SS_REQUEST from the VLR. This message contains information input by the user. If the alphabet used for the message is understood then the message shall either be fed to an application contained locally in the HLR or to the gsmSCF. If the alphabet is not understood then the error "UnknownAlphabet" shall be returned.

Message Destined for Local Application

If the message is destined for the local USSD application then the HLR shall transfer the message to the local application.

The HLR may subsequently receive one or more requests from the application which correspond to the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY indications. These shall be sent transparently to the VLR. When a confirmation is received from the VLR this shall be returned to the application.

When the HLR receives the result of the original operation from the application then it shall pass this to the VLR and initiate release of the CM connection.

Message Destined for gsmSCF

If the message is destined for the gsmSCF then the HLR shall transfer the message transparently to the gsmSCF.

The HLR may subsequently receive one or more MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY indications from the gsmSCF. These shall be sent transparently to the VLR. When a confirmation is received from the VLR this shall be returned to the gsmSCF.

When the HLR receives a MAP_PROCESS_UNSTRUCTURED_SS_REQUEST confirmation from the gsmSCF then it shall pass this to the VLR and closes the MAP provider service.

Error Handling

Both the VLR, the USSD Application and the gsmSCF may initiate release of the MAP service at any time. This is handled as shown in the diagrams.

The procedure in the HLR is shown in figure 22.9.4/1.

Process MS_INIT_USSD_HLR

22.9.4_1.1(2)

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR unless otherwise stated.

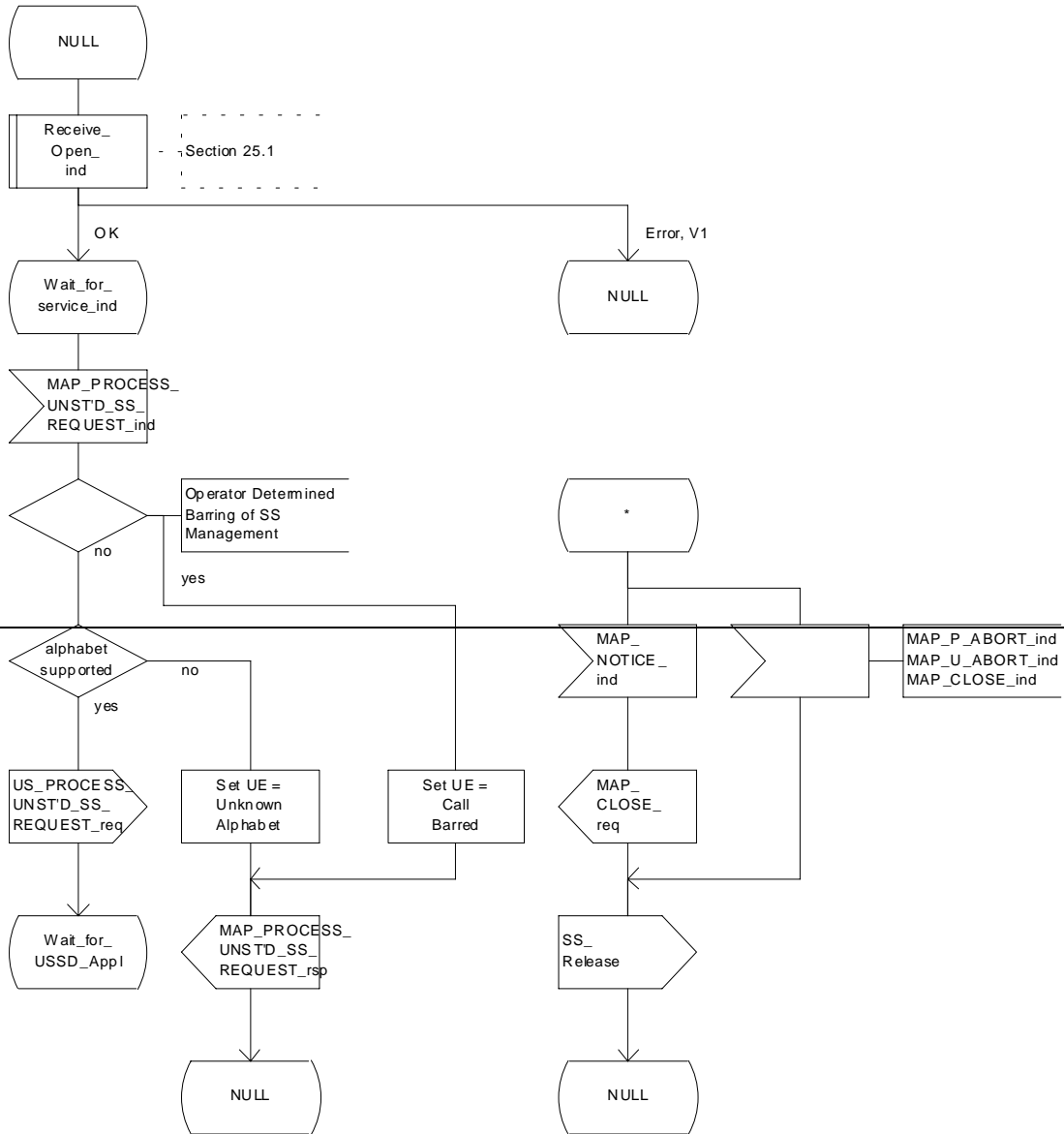


Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR unless otherwise stated.
 Arrow to right are to USSD application unless otherwise stated

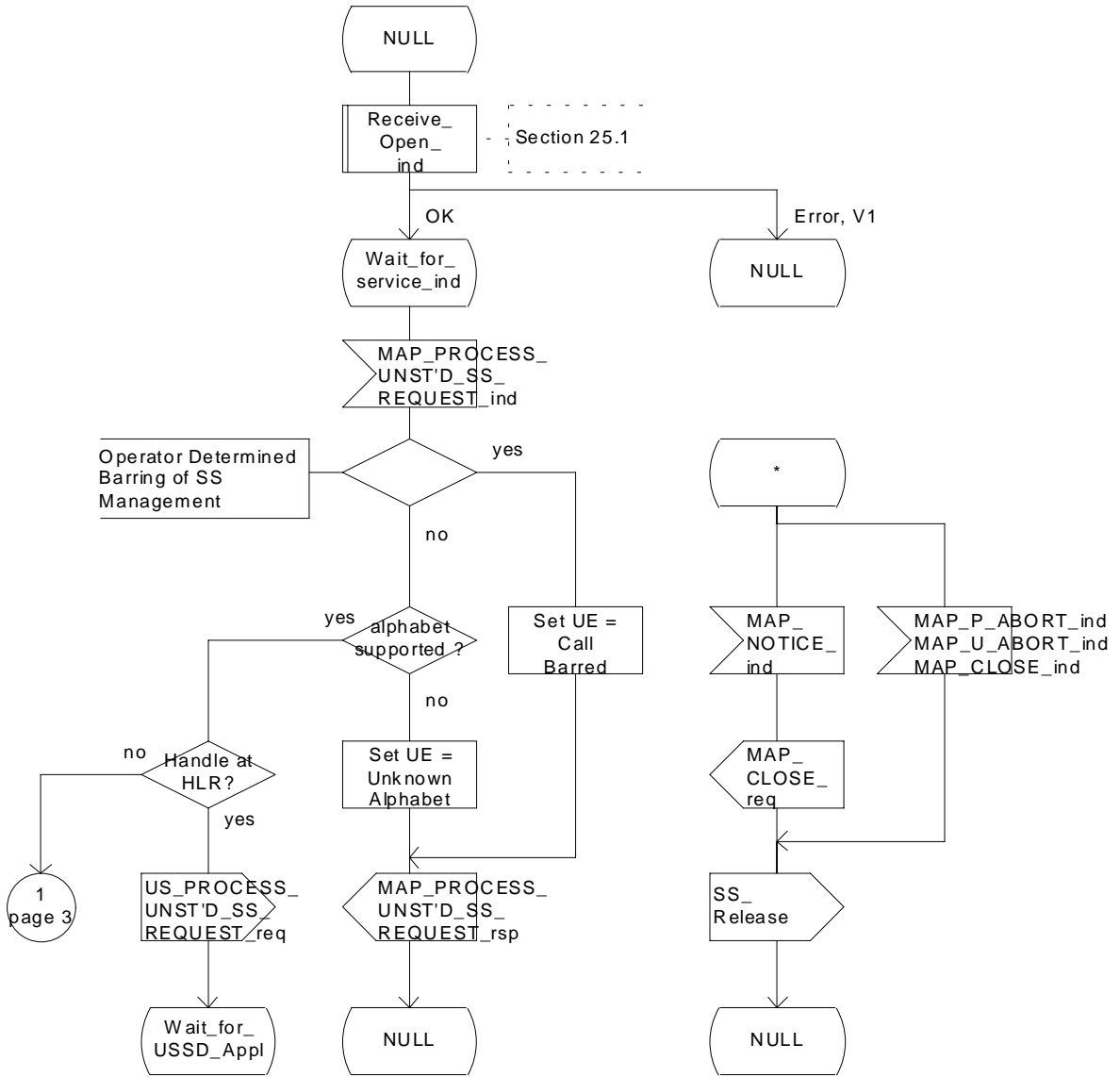


Figure 22.9.4/1 (sheet 1 of 24): Procedure MI_USSD_HLR

Process MS_INIT_USSD_HLR

22.9.4_1.2(2)

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

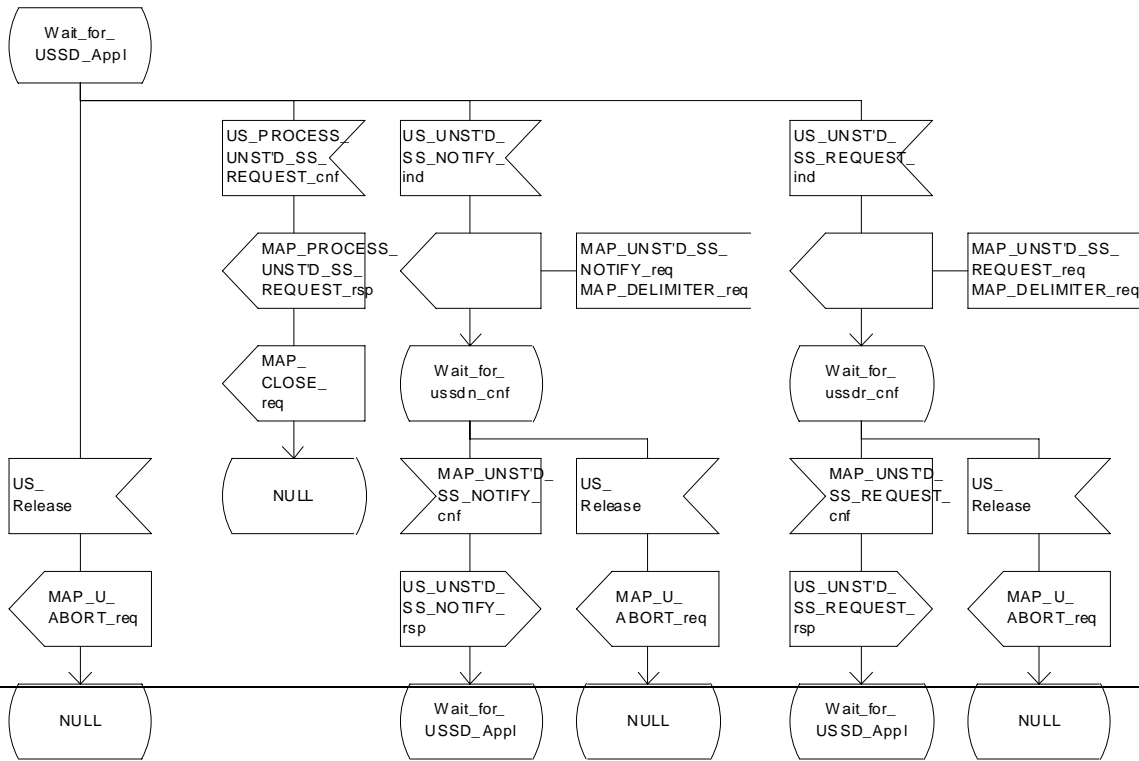


Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

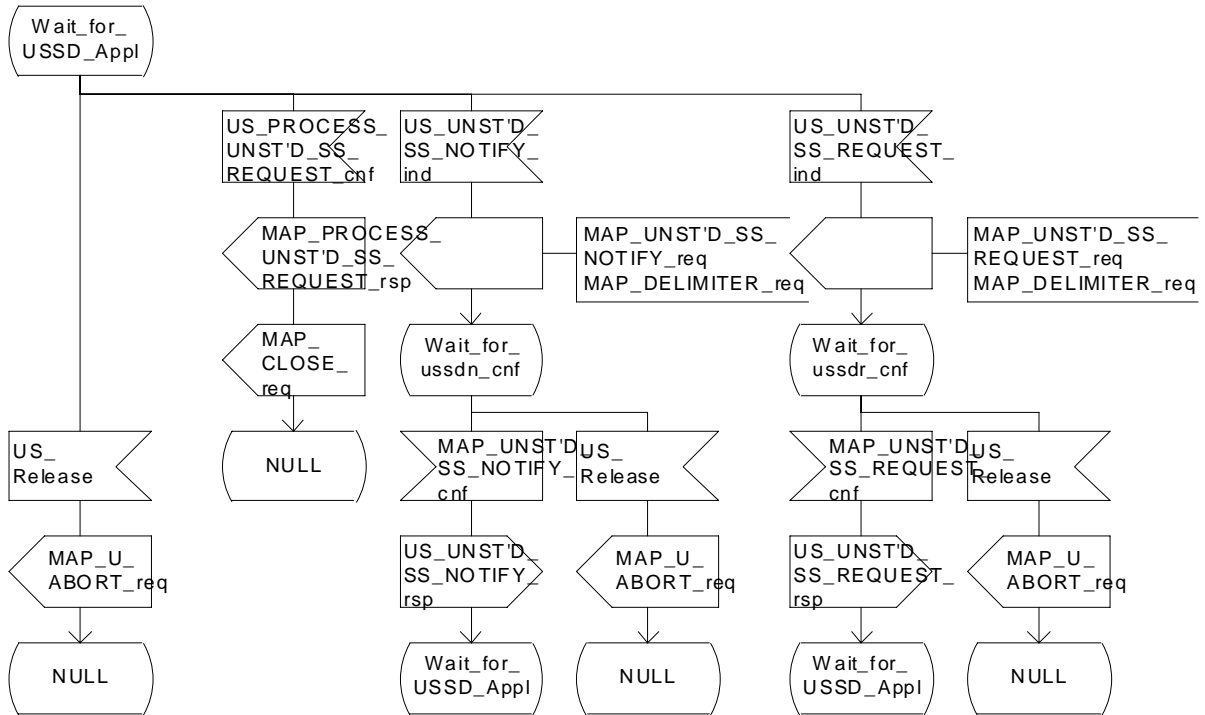


Figure 22.9.4/1 (sheet 2 of 24): Procedure MI_USSD_HLR

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to gsmSCF unless otherwise stated.

Section 22.11

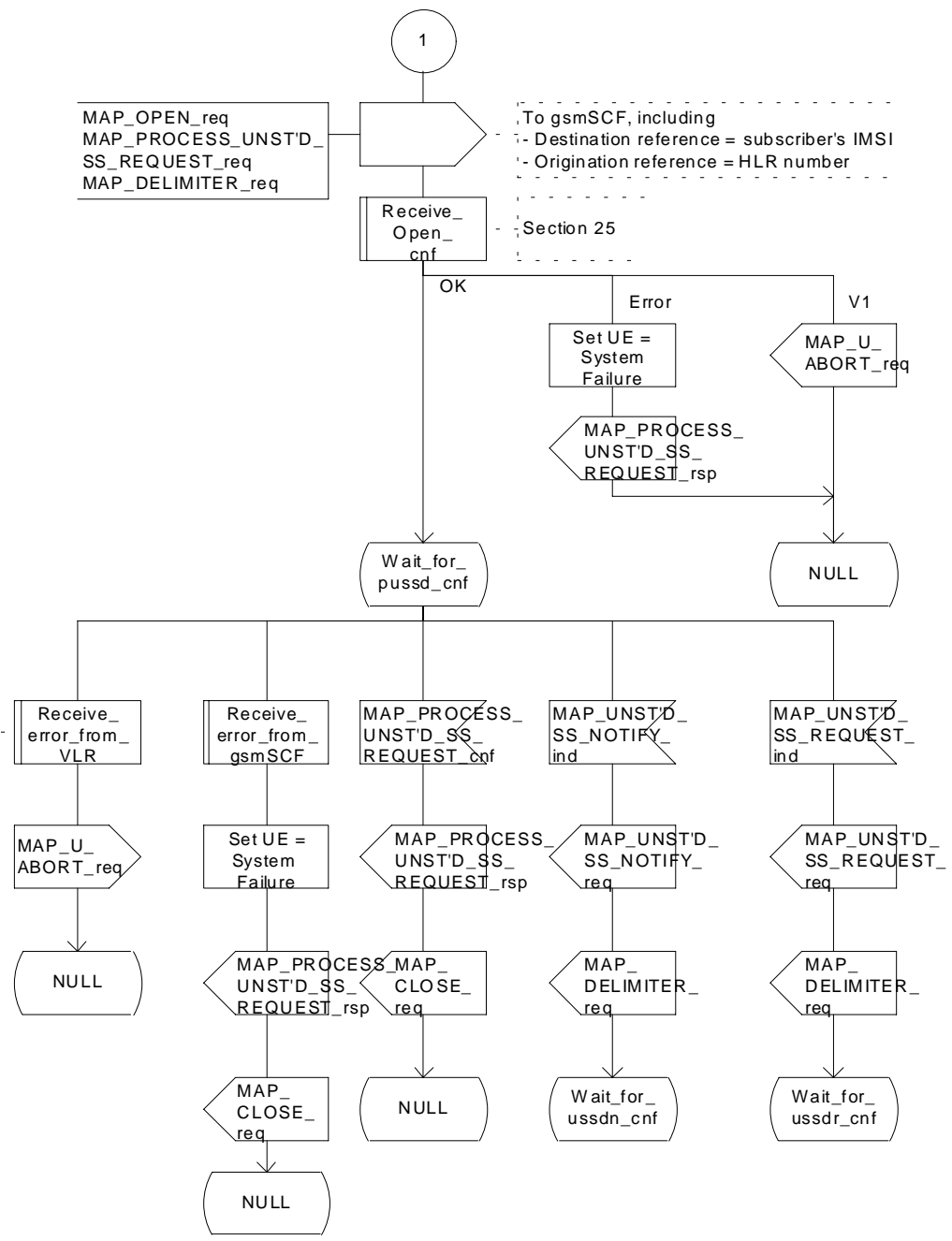


Figure 22.9.4/1 (sheet 3 of 4): Procedure MI USSD HLR

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

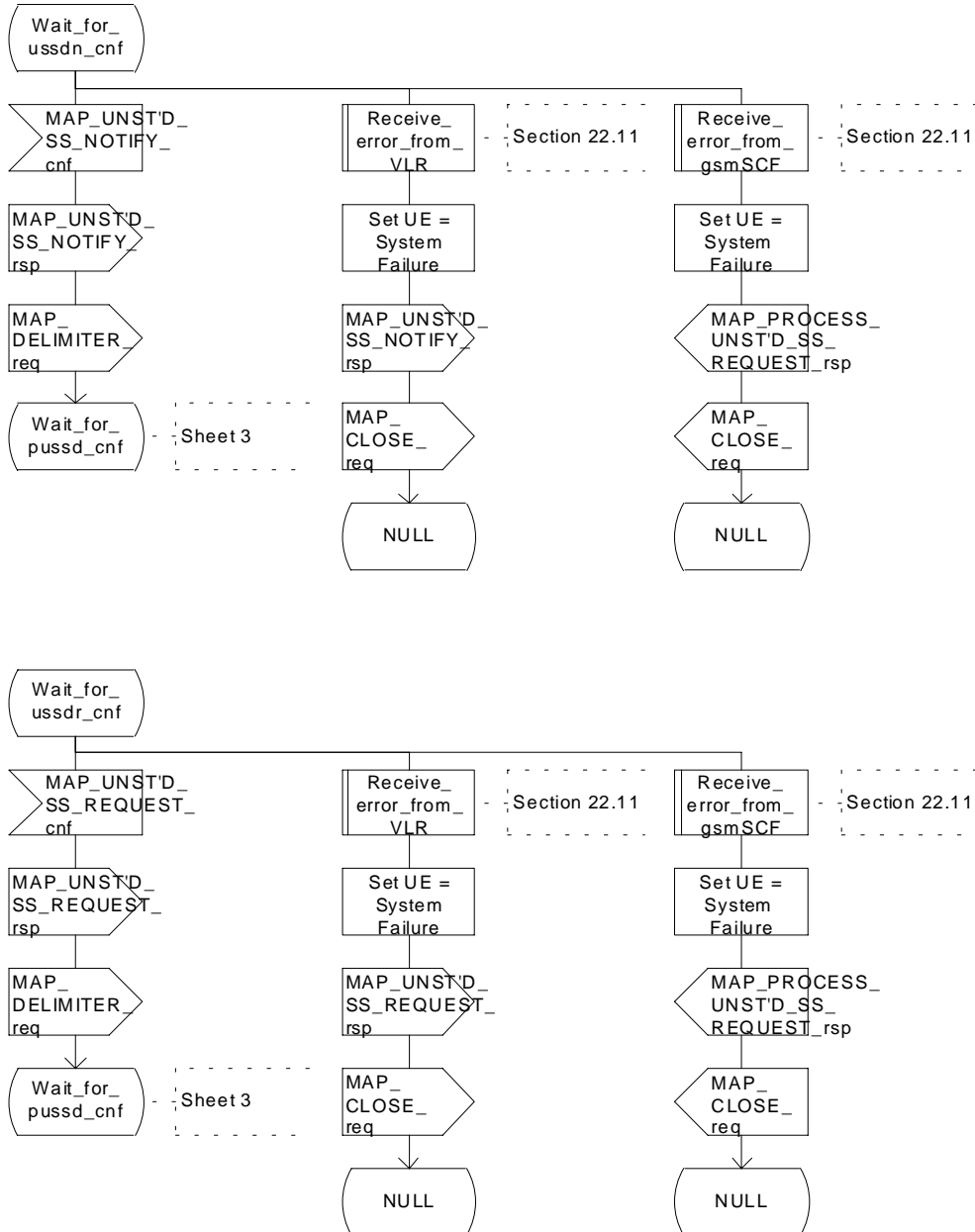


Figure 22.9.4/1 (sheet 4 of 4): Procedure MI USSD HLR

22.10.4 Procedure in the HLR

The procedure may be invoked either by the gsmSCF or by a USSD application local to the HLR. It may start by using either the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY service.

In both cases the HLR will first check whether the MS is reachable (~~i.e. there is a VLR identity stored in the subscriber record, the MS record is not marked as purged and the MS record is not marked "MSC Area Restricted"~~).

If the MS is reachable, the HLR will initiate a MAP dialogue with the VLR. Once the dialogue is successfully established the message received from the gsmSCF or USSD application will be sent to the MSCVLR.

Following transfer of the message the HLR will wait for a confirmation from the MSCVLR. This will be sent to the gsmSCF or USSD application as appropriate.

Following this, the HLR may receive further uses of the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY services, or may receive a MAP_CLOSE_ind.

In the event of an error, the MAP process with the VLR shall be released and if necessary the MAP process with the gsmSCF shall be aborted, as shown in the diagram.

Message Originated by gsmSCF

If the message is originated by the gsmSCF then the HLR shall transfer the message transparently to the VLR.

The HLR may subsequently receive one or more MAP_UNSTRUCTURED_SS_REQUEST_ind or MAP_UNSTRUCTURED_SS_NOTIFY_ind indications from the ~~VLR~~gsmSCF. These shall be sent transparently to the ~~gsmSCF~~VLR. When a confirmation is received from the ~~gsmSCF~~VLR this shall be returned to the ~~VLR~~gsmSCF.

When the HLR receives a MAP_CLOSE_ind from the gsmSCF then it shall pass this to the VLR and close the MAP dialogue.

The procedure in the HLR is shown in figure 22.10.4/1 and 22.10.4/2.

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR,
Arrows to right are to gsmSCF
unless otherwise stated.

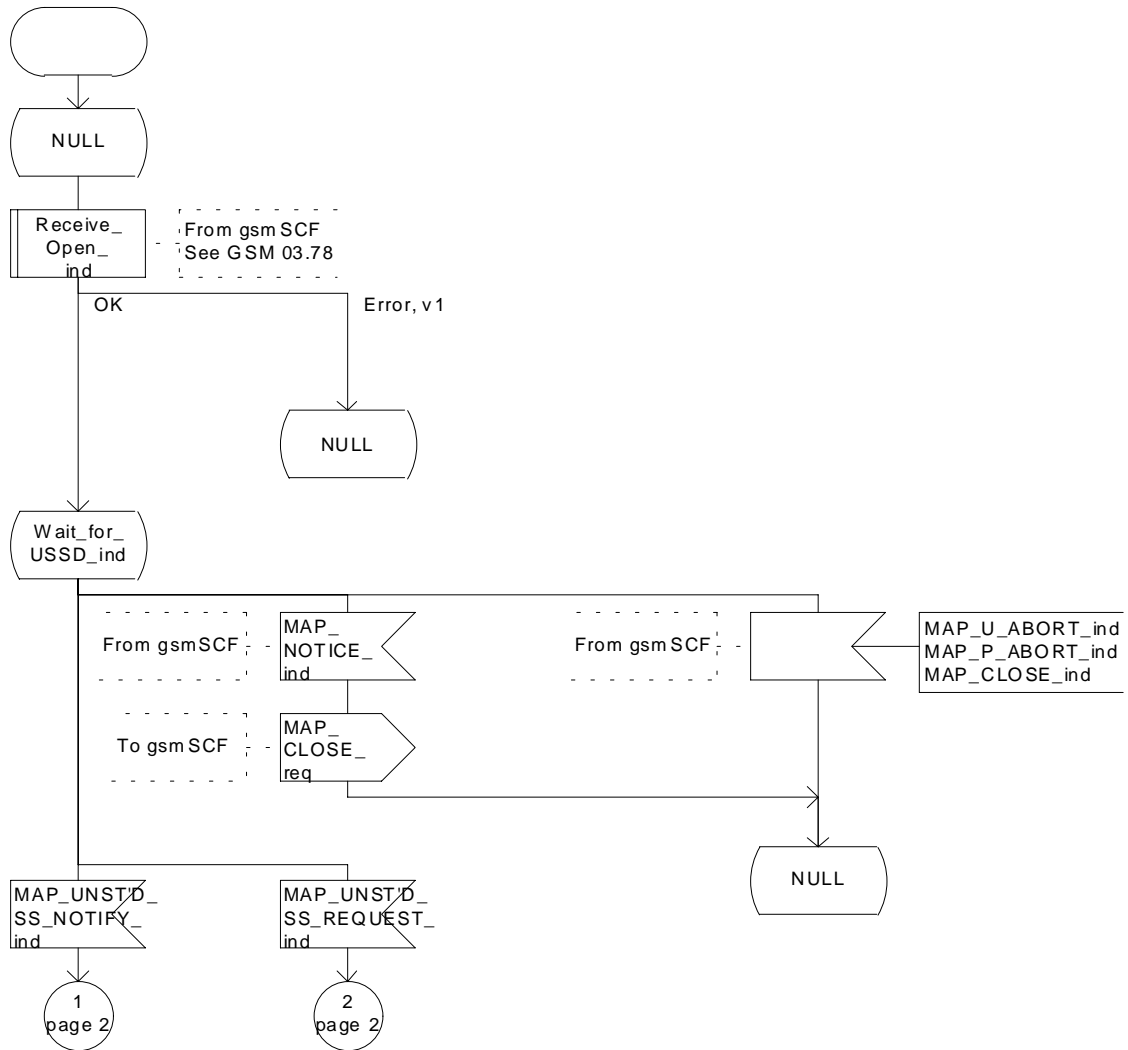


Figure 22.10.4/1 (sheet 1 of 5): Procedure NI USSD_HLR

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR,
Arrows to right are to gsm SCF
unless otherwise stated.

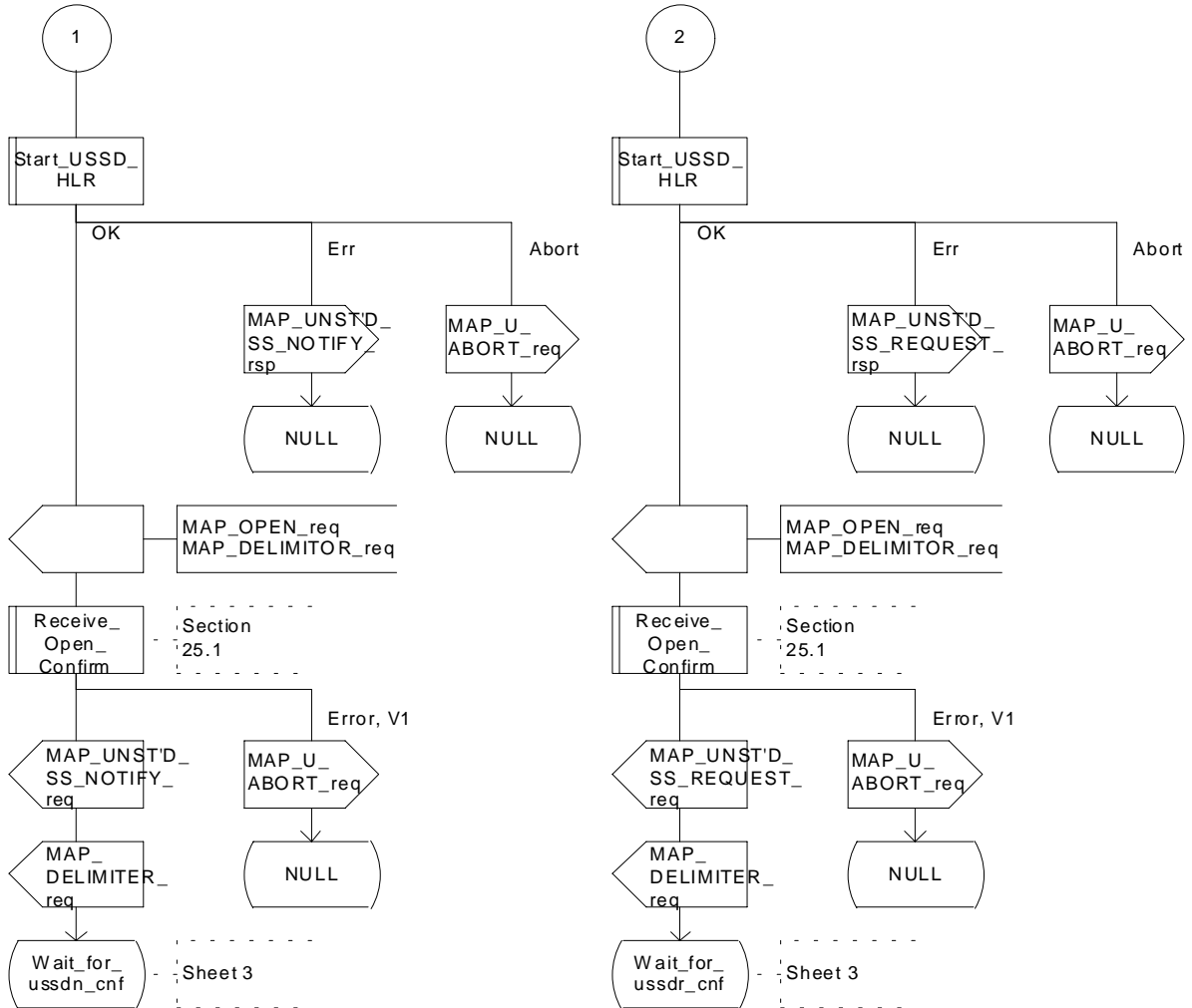


Figure 22.10.4/1 (sheet 2 of 5): Procedure NI_USSD_HLR

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR,
Arrows to right are to gsmSCF
unless otherwise stated.

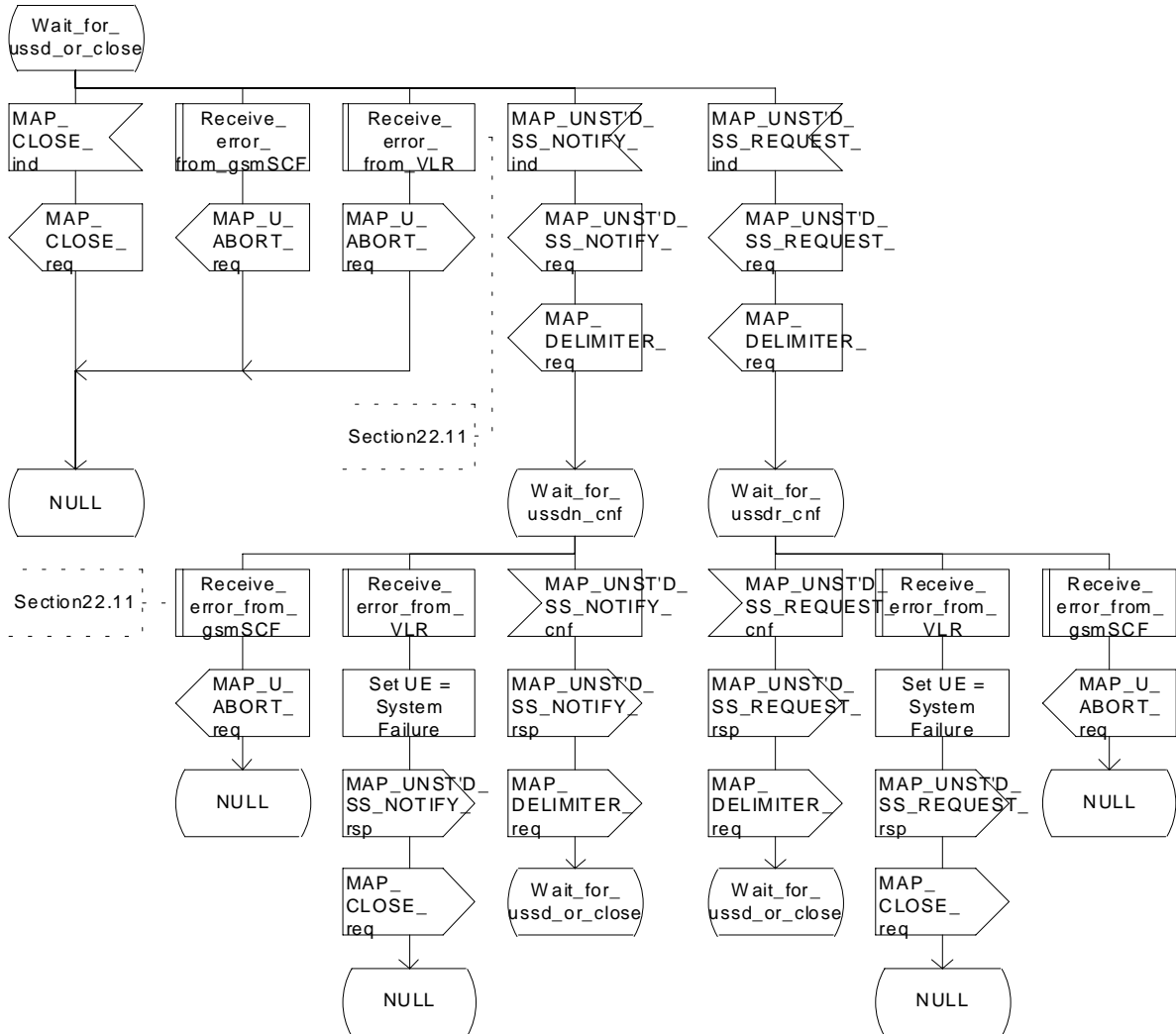


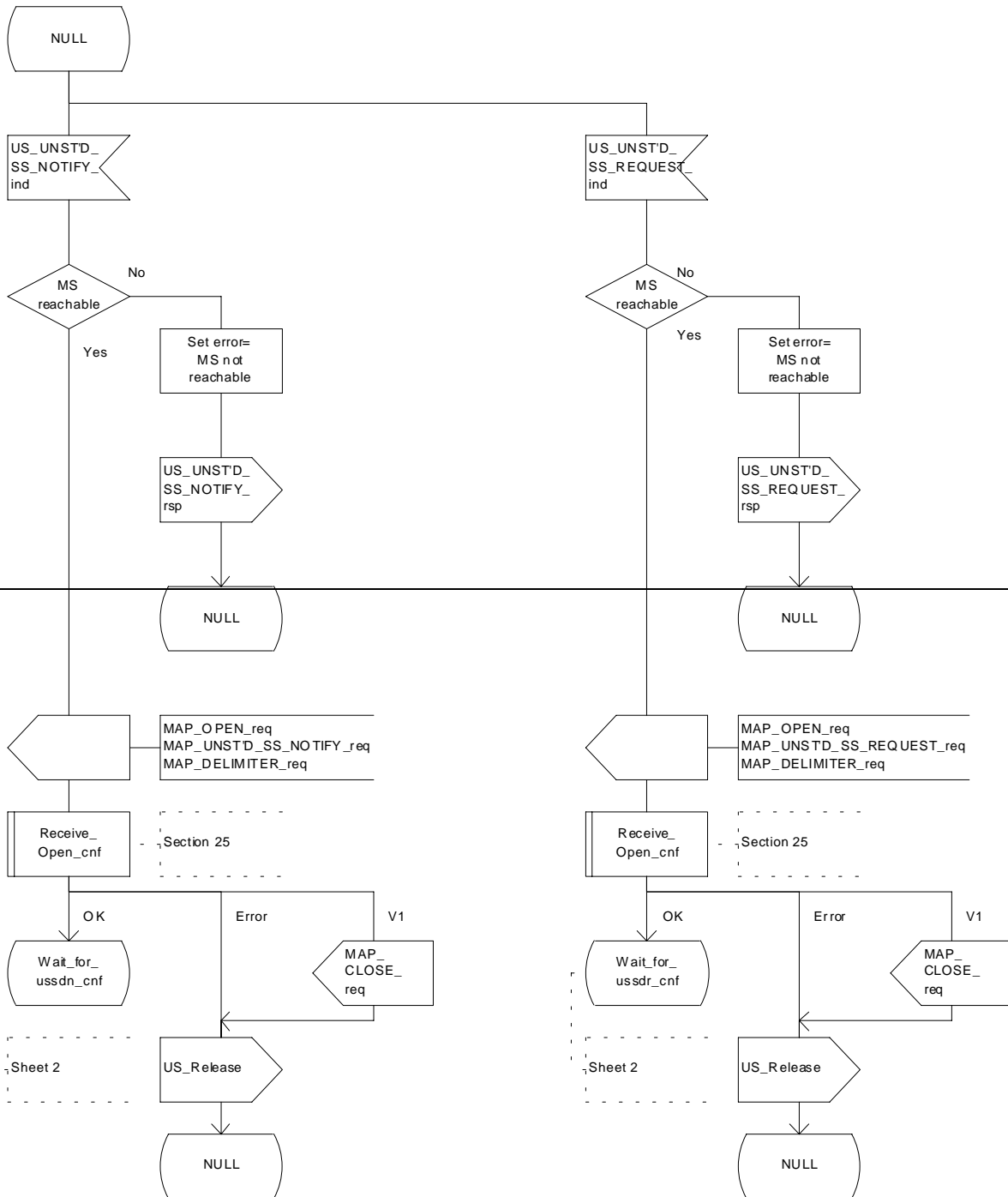
Figure 22.10.4/1 (sheet 3 of 5): Procedure NI USSD HLR

Process NW_INIT_USSD_HLR

22.10.4_1.1(2)

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.



Sheet 2

Sheet 2

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

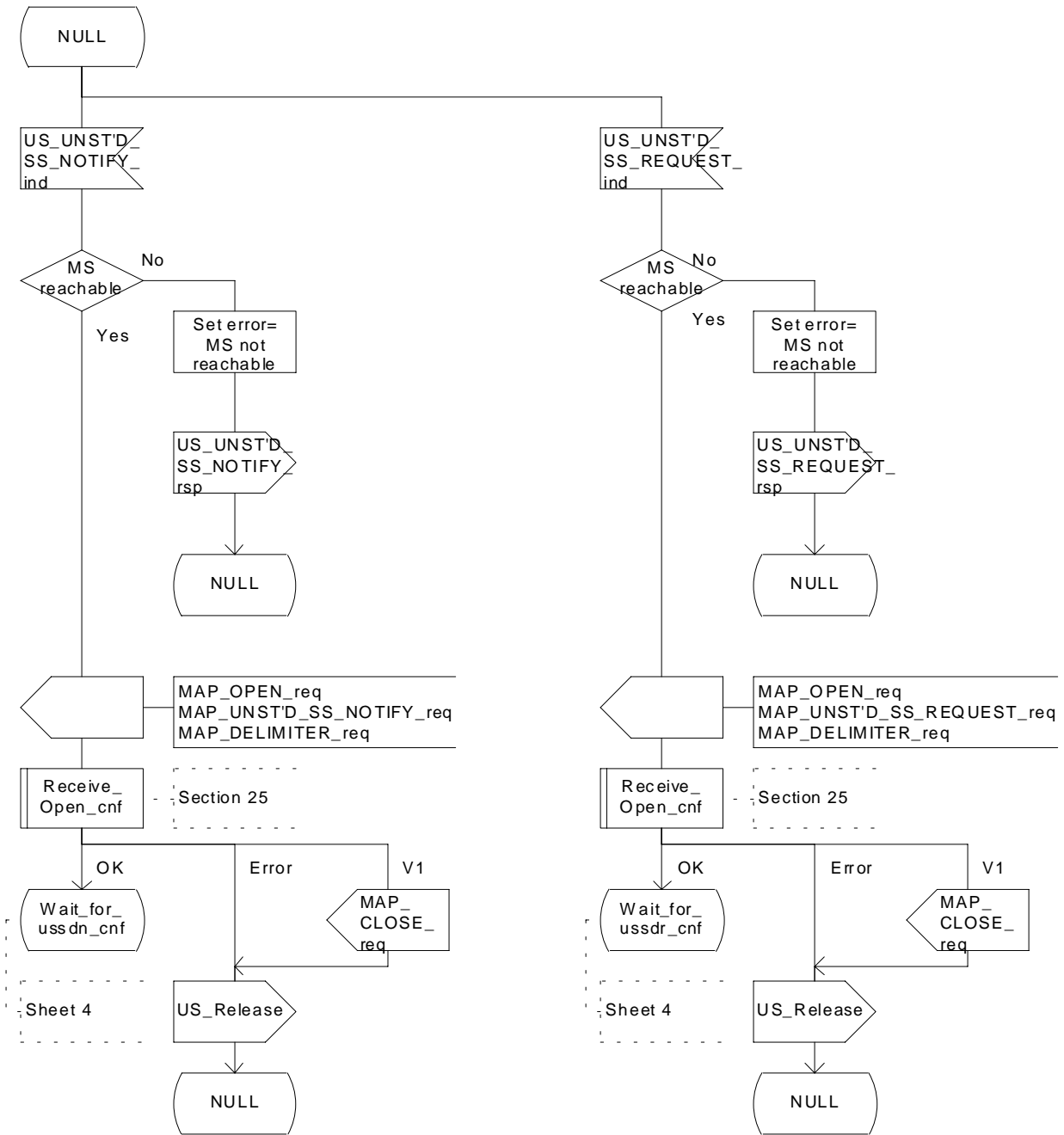


Figure 22.10.4/1 (sheet 41 of 52): Procedure NI_USSD_HLR

Process NW_INIT_USSD_HLR

22.10.4_1.2(2)

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

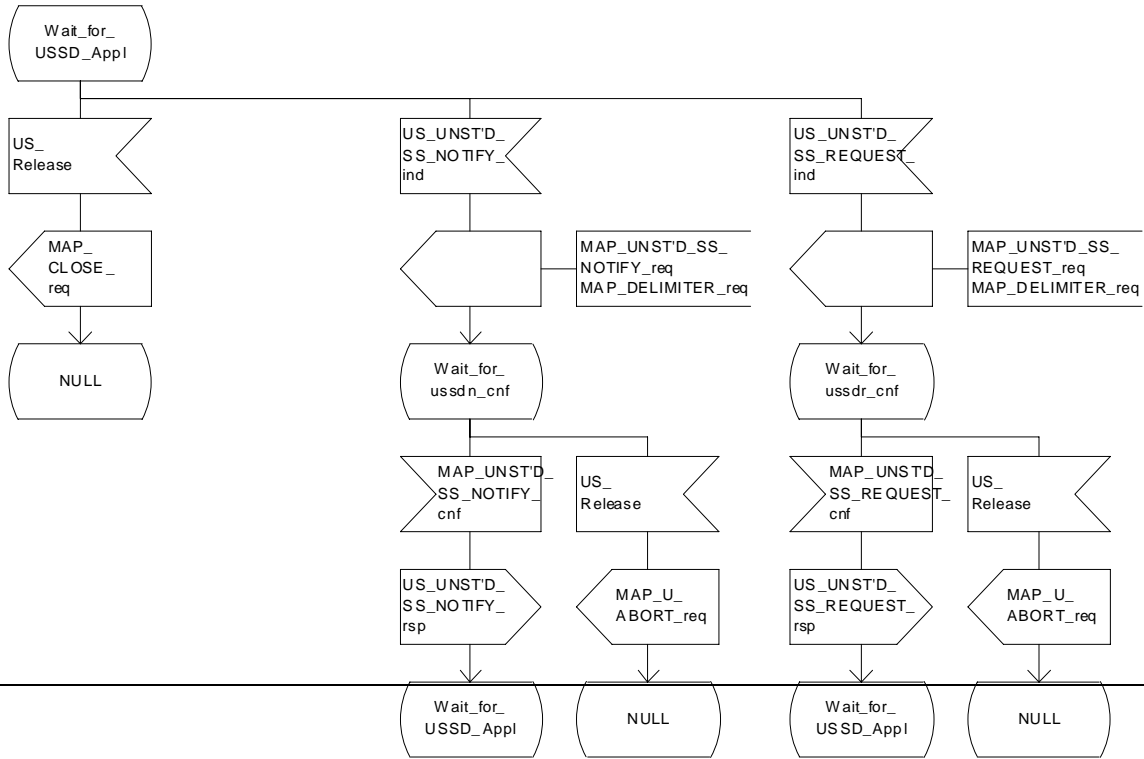


Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

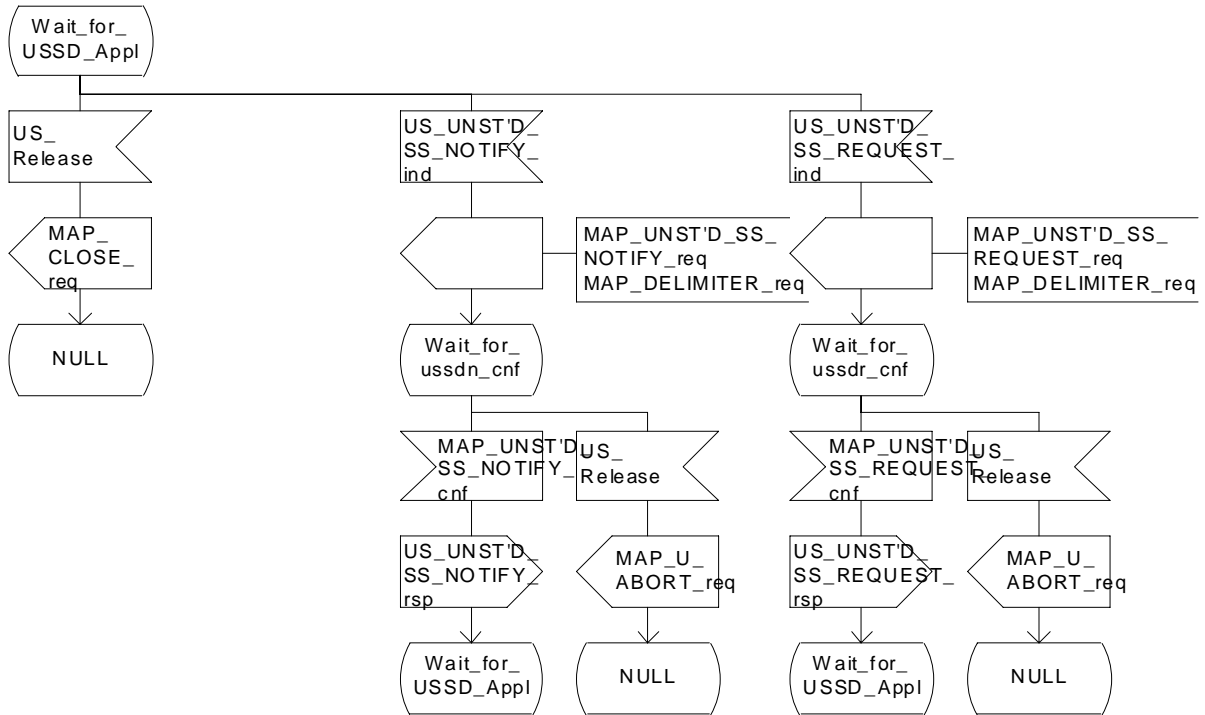


Figure 22.10.4/1 (sheet 52 of 52): Procedure NI_USSD_HLR

Figure 22.10.4/2: Macro to check MS is reachable at the HLR for a network initiated USSD operation,

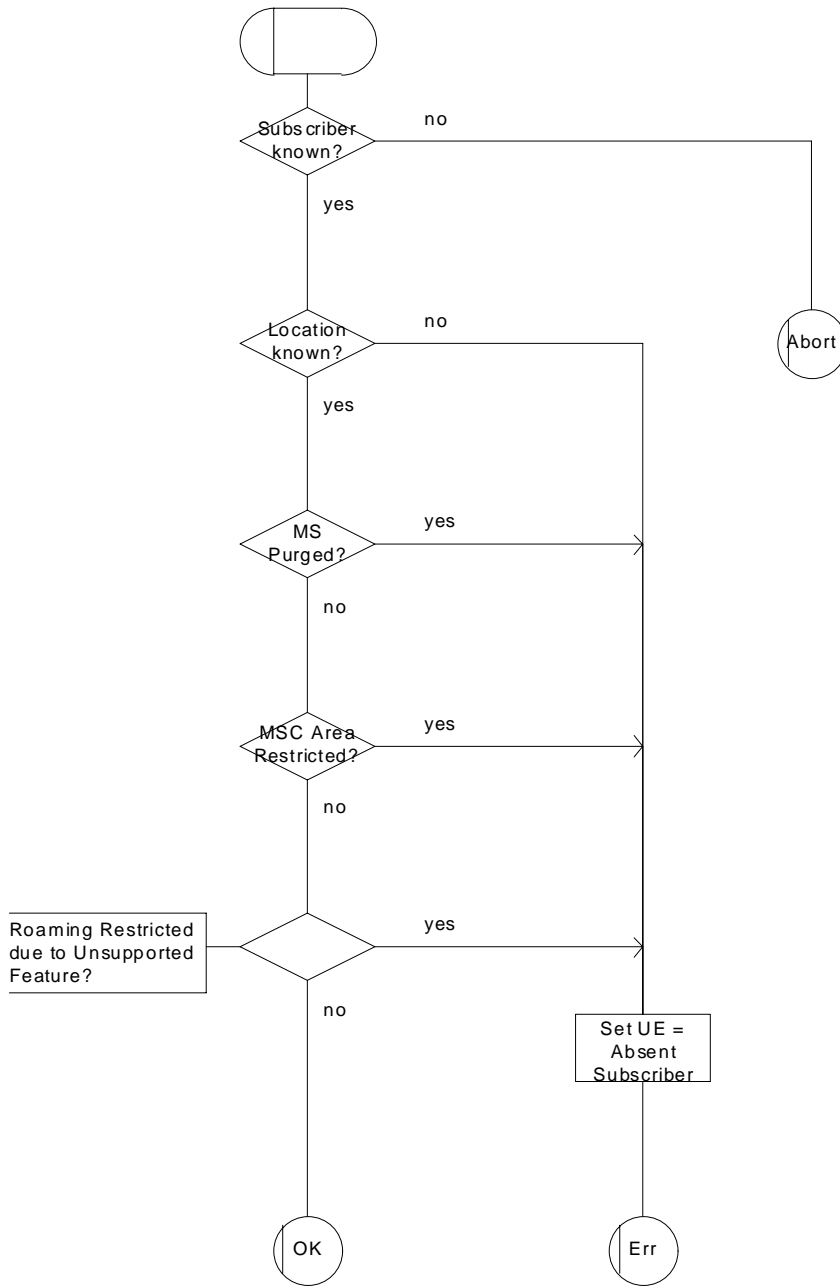


Figure 22.10.4/2: Macro Start USSD HLR

*** Next Modified Section ***

22.11.2 SS Error handling macros

Macro Receive_errors_MSC

This macro is used by the MSC to receive signals which should lead to failure if received in any state of a supplementary service process. If the air interface connection is released by the MS, the communication towards the VLR is aborted, and the MSC should return to a stable "NULL" state. If a MAP_NOTICE indication is received from the VLR, or the VLR aborts or unexpectedly closes the connection, then the air interface connection shall be released. The macro is described in figure 22.11.2/1.

Macro Receive_error_from_MSC

This macro is used by the VLR to receive signals from the MSC which should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the MSC, that connection is closed before the only outcome of the macro, "err" is reported back to the calling process. The macro is described in figure 22.11.2/2.

Macro Receive_error_from_HLR

This macro is used by the VLR to receive signals from the HLR which should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the ~~MSC~~HLR, that connection is closed. The macro is described in figure 22.11.2/3.

Macro Receive error from VLR

This macro is used by the HLR to receive signals from the VLR that should lead to failure if received in any state of a supplementary service process. If a MAP NOTICE indication is received from the VLR, that connection is closed before the only outcome of the macro, "err" is reported back to the calling process. The macro is described in figure 22.11.2/4.

Macro Receive error from gsmSCF

This macro is used by the HLR to receive signals from the gsmSCF that should lead to failure if received in any state of a supplementary service process. If a MAP NOTICE indication is received from the gsmSCF, that connection is closed. The macro is described in figure 22.11.2/5.

*** New SDLs ***

Figure 22.11.2/4: Macro to receive errors from the VLR during supplementary services procedures in the HLR

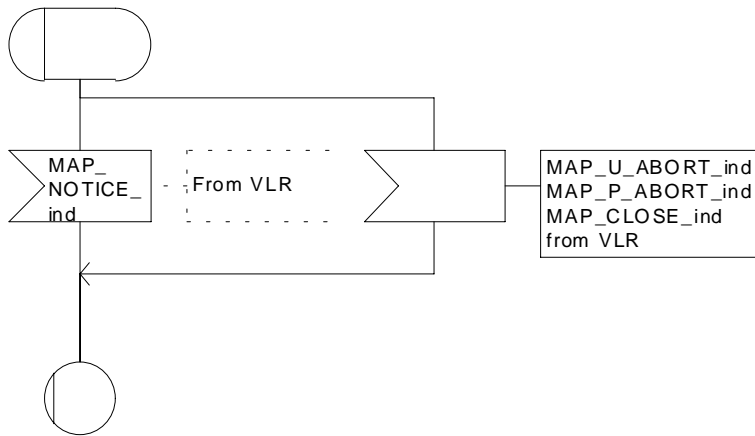


Figure 22.11.2/4: Macro Receive error from VLR

Macrodefinition Receive_error_from_gsmSCF

22.11.2_5(1)

Figure 22.11.2/5: Macro to receive errors from the gsmSCF while the HLR is waiting for a confirmation of a supplementary service request sent to the gsmSCF

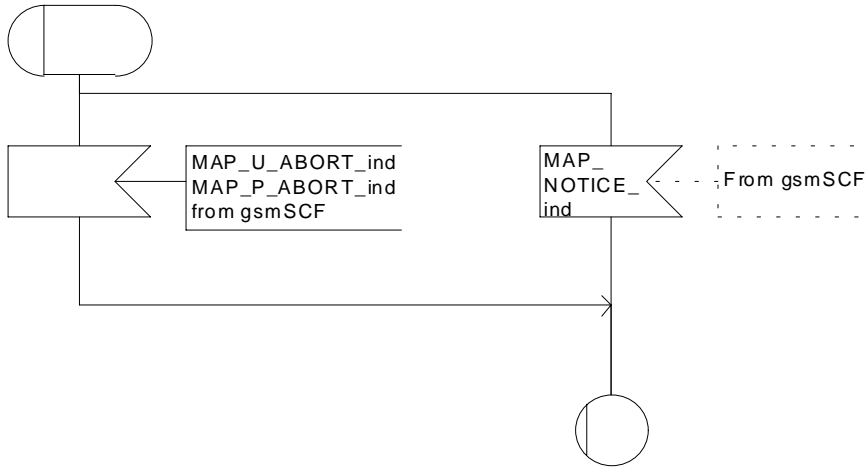


Figure 22.11.2/5: Macro Receive error from gsmSCF

CHANGE REQUEST

29.002 CR 069

Current Version: 3.2.0

For submission to: CN#06 for approval for information strategic non-strategic

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

Source: TSG N2 **Date:** 18 Nov1999

Subject: Correction of the USSD procedure in the HLR.

Work item: USSD & Follow Me

Category:	F Correction	<input type="checkbox"/>	Release:	Phase 2	<input type="checkbox"/>
	A Corresponds to a correction in an earlier release	<input checked="" type="checkbox"/>		Release 96	<input type="checkbox"/>
	B Addition of feature	<input type="checkbox"/>		Release 97	<input type="checkbox"/>
	C Functional modification of feature	<input type="checkbox"/>		Release 98	<input type="checkbox"/>
	D Editorial modification	<input type="checkbox"/>		Release 99	<input checked="" type="checkbox"/>
			Release 00	<input type="checkbox"/>	

Reason for change: Category C1: Essential Correction because the USSD procedures between the HLR and gsmSCF are not specified appropriately in MAP.

The applicability of the USSD functionality was extended to incorporate the gsmSCF in GSM release 97. However, GSM 09.02 has only partially been updated to reflect this.

This change requests proposes the modification of the text describing the "Procedure in the HLR" to include reference to the gsmSCF and HLR for the case of Follow Me.

Clauses affected: 22.9.4 & 22.10.4, 22.11.2

Other specs affected:	Other 3G core specifications	<input type="checkbox"/>	→ List of CRs:	CR 09.02-A237r1, 09.02-A277
	Other GSM core specifications	<input type="checkbox"/>	→ List of CRs:	
	MS test specifications	<input type="checkbox"/>	→ List of CRs:	
	BSS test specifications	<input type="checkbox"/>	→ List of CRs:	
	O&M specifications	<input type="checkbox"/>	→ List of CRs:	

Other comments:

22.9.4 Procedures in the HLR

The initiation of the process is shown in subclause 22.1.3.

Once a MAP dialogue is established, the HLR may handle the MAP_PROCESS_UNSTRUCTURED_SS_REQUEST from the VLR. This message contains information input by the user. If the alphabet used for the message is understood then the message shall either be fed to an application contained locally in the HLR or to the gsmSCF or to a secondary HLR where the USSD application is located. If the alphabet is not understood then the error "UnknownAlphabet" shall be returned.

Message Destined for Local Application

If the message is destined for the local USSD application then the HLR shall transfer the message to the local application.

The HLR may subsequently receive one or more requests from the application which correspond to the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY indications. These shall be sent transparently to the VLR. When a confirmation is received from the VLR this shall be returned to the application.

When the HLR receives the result of the original operation from the application then it shall pass this to the VLR and initiate release of the CM connection.

Message Destined for gsmSCF or secondary HLR

If the message is destined for the gsmSCF or secondary HLR then the primary HLR shall transfer the message transparently to the gsmSCF next node.

The primary HLR may subsequently receive one or more MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY indications from the gsmSCF. These shall be sent transparently to the VLR. When a confirmation is received from the VLR this shall be returned to the gsmSCF.

When the primary HLR receives a MAP_PROCESS_UNSTRUCTURED_SS_REQUEST confirmation from the gsmSCF then it shall pass this to the VLR and closes the MAP provider service.

Error Handling

~~Both~~ The VLR, the USSD Application and the gsmSCF or secondary HLR may initiate release of the MAP service at any time. This is handled as shown in the diagrams.

The procedure in the primary and secondary HLR is shown in figure 22.9.4/1.

Process MS_INIT_USSD_HLR

22.9.4_1.1(2)

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR unless otherwise stated.

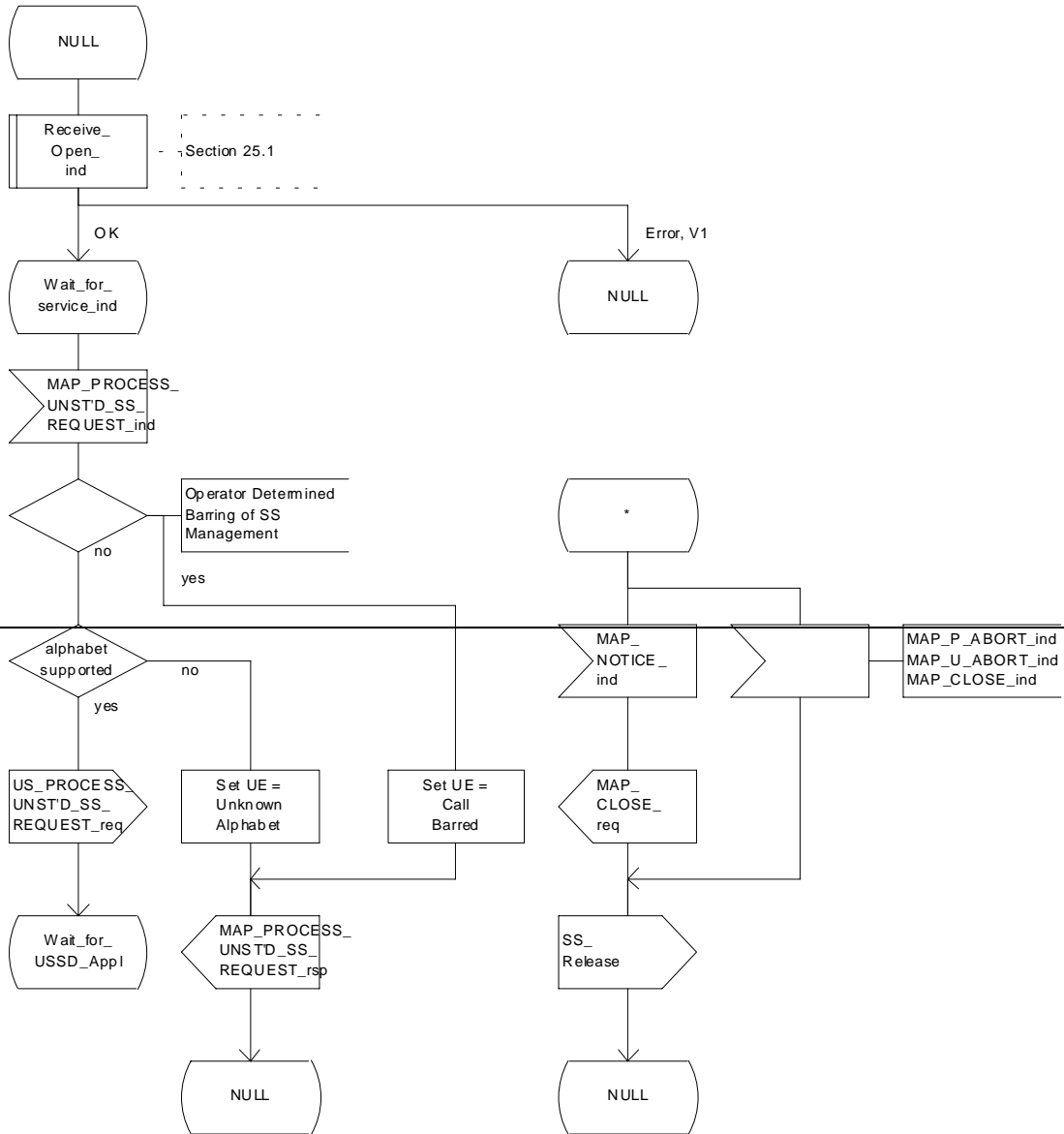


Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR unless otherwise stated.
 Arrow to right are to USSD application unless otherwise stated

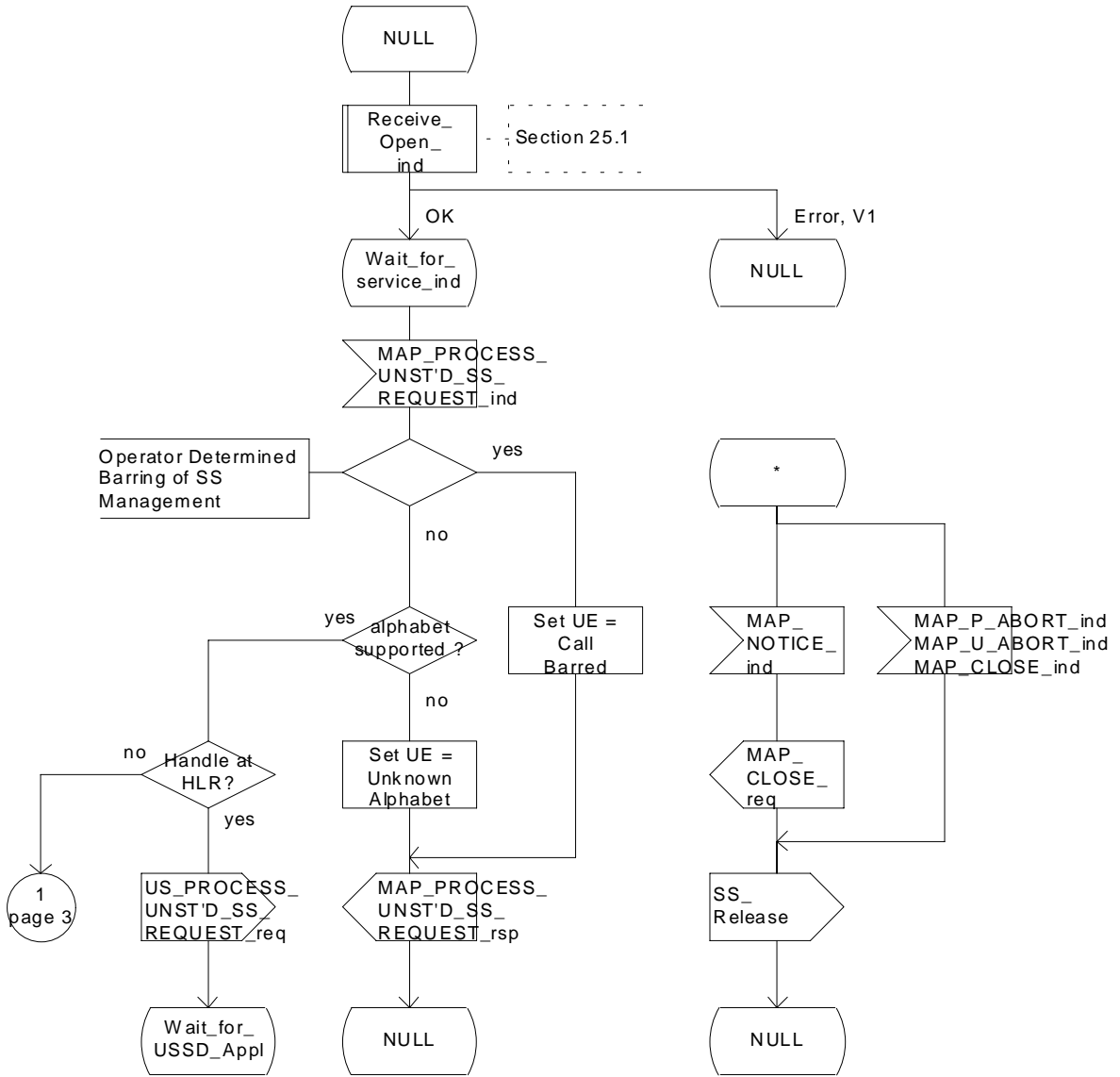


Figure 22.9.4/1 (sheet 1 of 24): Procedure MI_USSD_HLR

Process MS_INIT_USSD_HLR

22.9.4_1.2(2)

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

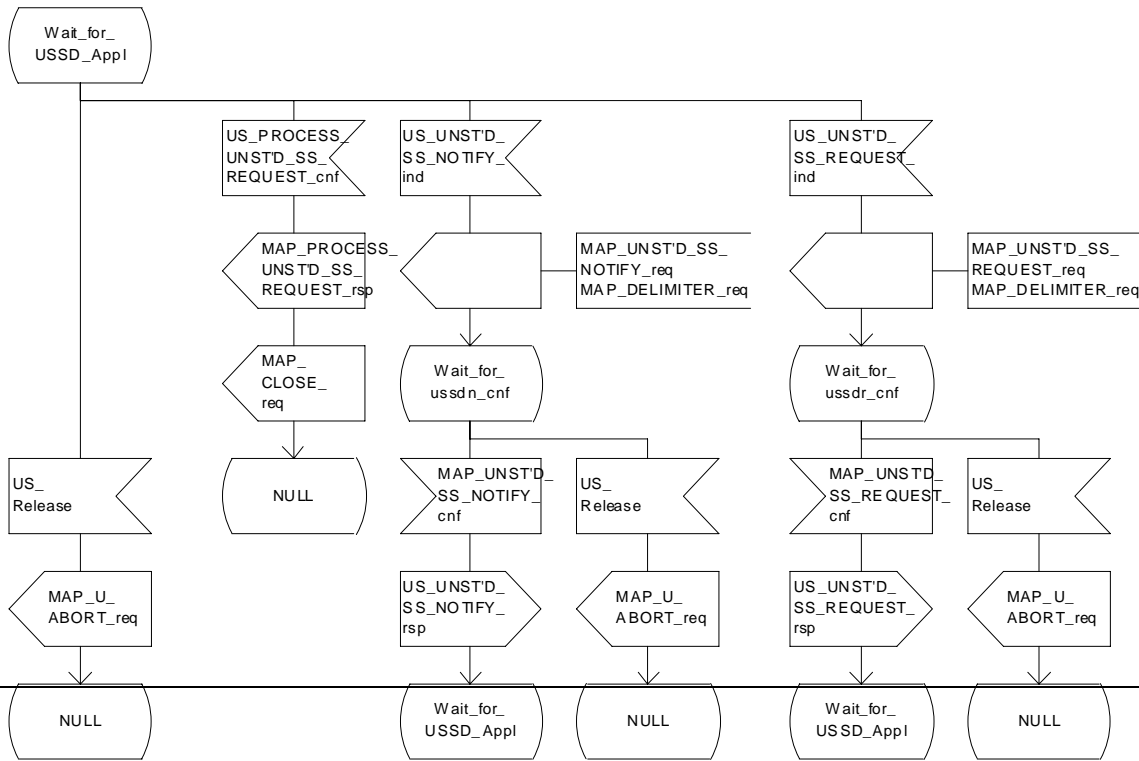


Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

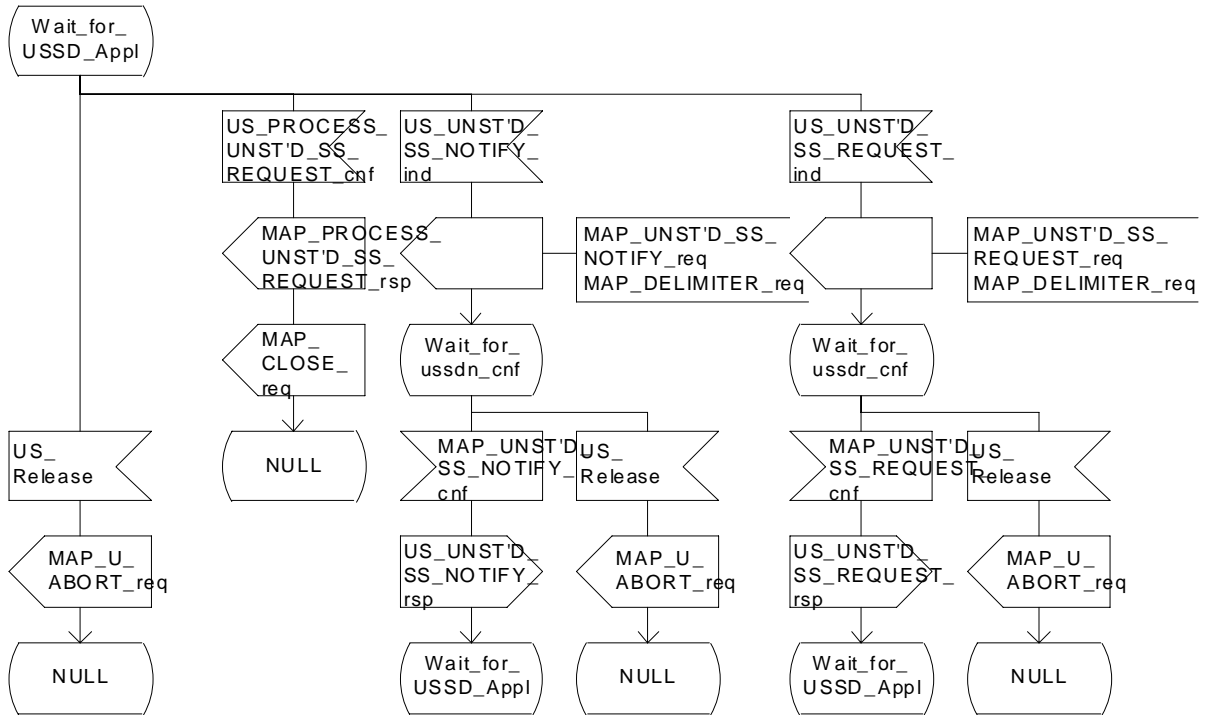


Figure 22.9.4/1 (sheet 2 of 24): Procedure MI_USSD_HLR

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

Arrows to left are to VLR, arrows to right are to the next node unless otherwise stated.

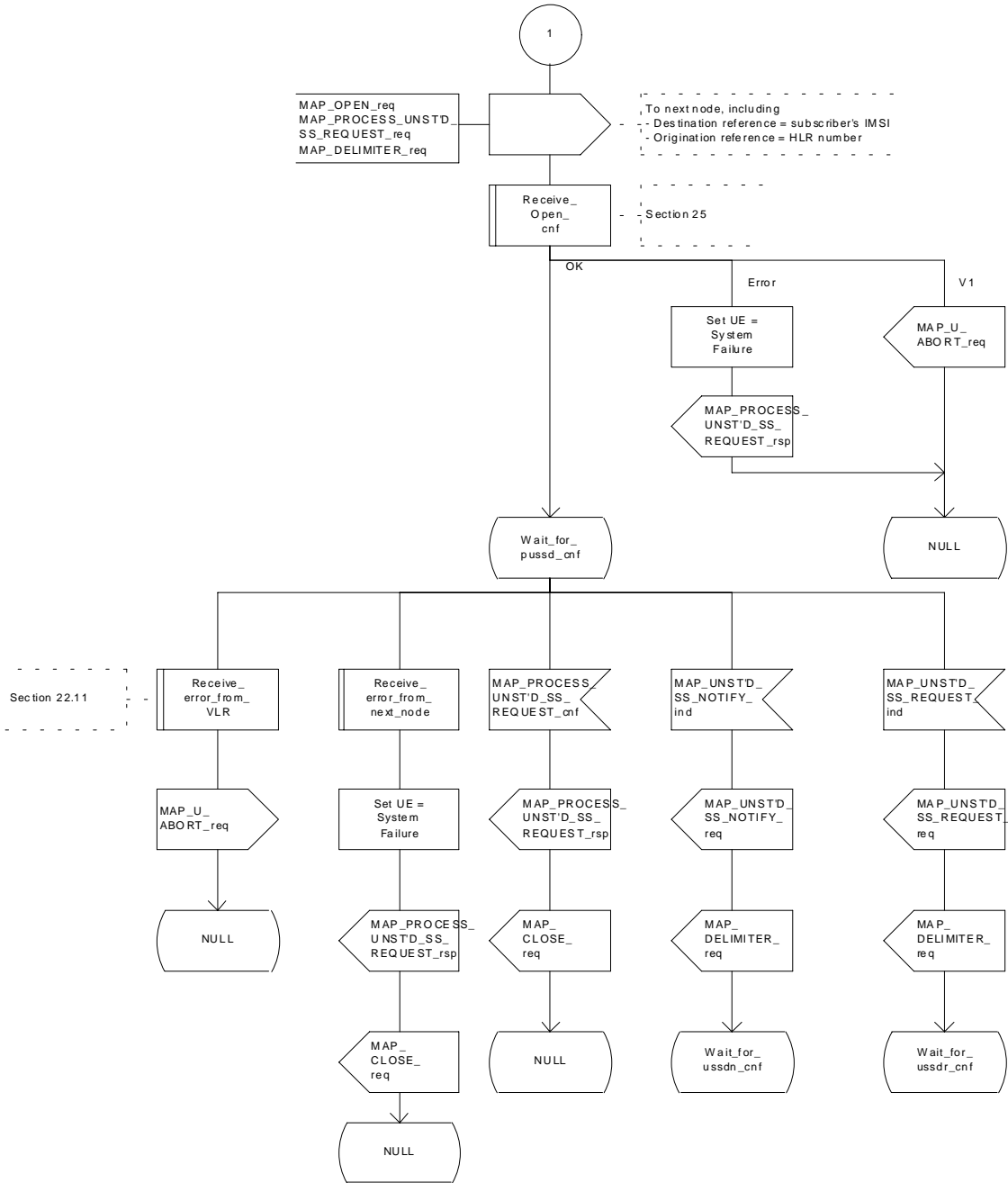


Figure 22.9.4/1 (sheet 3 of 4): Procedure MI USSD_HLR

Figure 22.9.4/1: Handling of mobile initiated USSD at HLR.

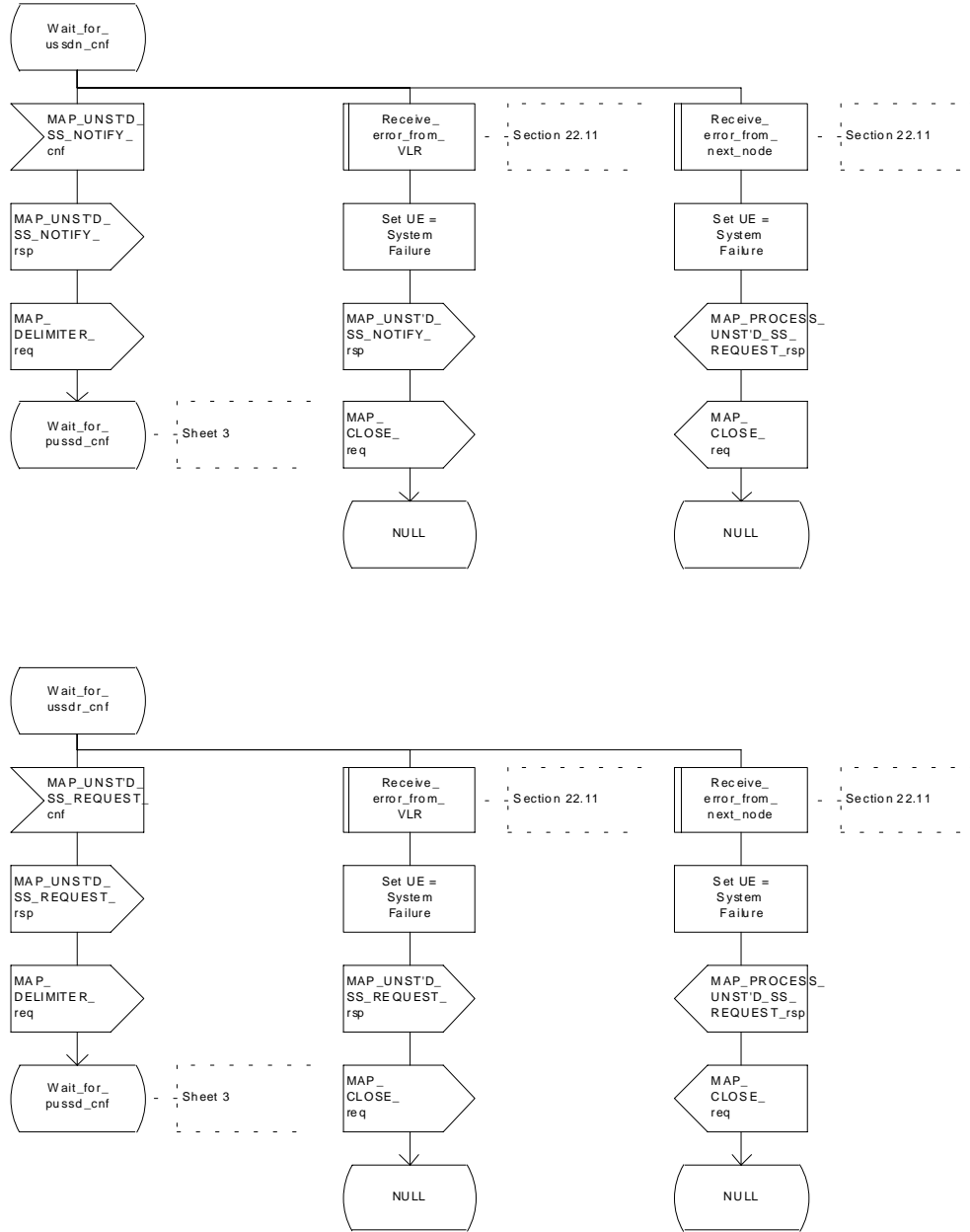


Figure 22.9.4/1 (sheet 4 of 4): Procedure MI USSD_HLR

22.10.4 Procedure in the HLR

The procedure may be invoked either by ~~the~~ gsmSCF, a secondary HLR or by a USSD application local to the primary HLR. It may start by using either the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY service.

In both cases the primary HLR will first check whether the MS is reachable ~~(i.e. there is a VLR identity stored in the subscriber record, the MS record is not marked as purged and the MS record is not marked "MSC Area Restricted")~~.

If the MS is reachable, the primary HLR will initiate a MAP dialogue with the VLR. Once the dialogue is successfully established the message received from the gsmSCF or secondary HLR or USSD application will be sent to the MSCVLR.

Following transfer of the message the primary HLR will wait for a confirmation from the MSCVLR. This will be sent to the gsmSCF or secondary HLR or USSD application as appropriate.

Following this, the primary HLR may receive further uses of the MAP_UNSTRUCTURED_SS_REQUEST or MAP_UNSTRUCTURED_SS_NOTIFY services, or may receive a MAP_CLOSE_ind.

In the event of an error, the MAP process with the VLR shall be released and if necessary the MAP process with the gsmSCF or secondary HLR shall be aborted, as shown in the diagram.

Message Originated by gsmSCF or secondary HLR

If the message is originated by the gsmSCF or secondary HLR then the primary HLR shall transfer the message transparently to the VLR.

The primary HLR may subsequently receive one or more MAP_UNSTRUCTURED_SS_REQUEST_ind or MAP_UNSTRUCTURED_SS_NOTIFY_ind indications from the ~~VLR~~ gsmSCF or secondary HLR. These shall be sent transparently to the ~~gsmSCF~~ VLR. When a confirmation is received from the ~~gsmSCF~~ VLR this shall be returned to the ~~VLR~~ next node as appropriate.

When the primary HLR receives a MAP_CLOSE_ind from the gsmSCF or secondary HLR then it shall pass this to the VLR and close the MAP dialogue.

The procedure in the primary and secondary HLR is shown in figure 22.10.4/1 and 22.10.4/2.

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR.
Arrows to right are to the next node unless otherwise stated.

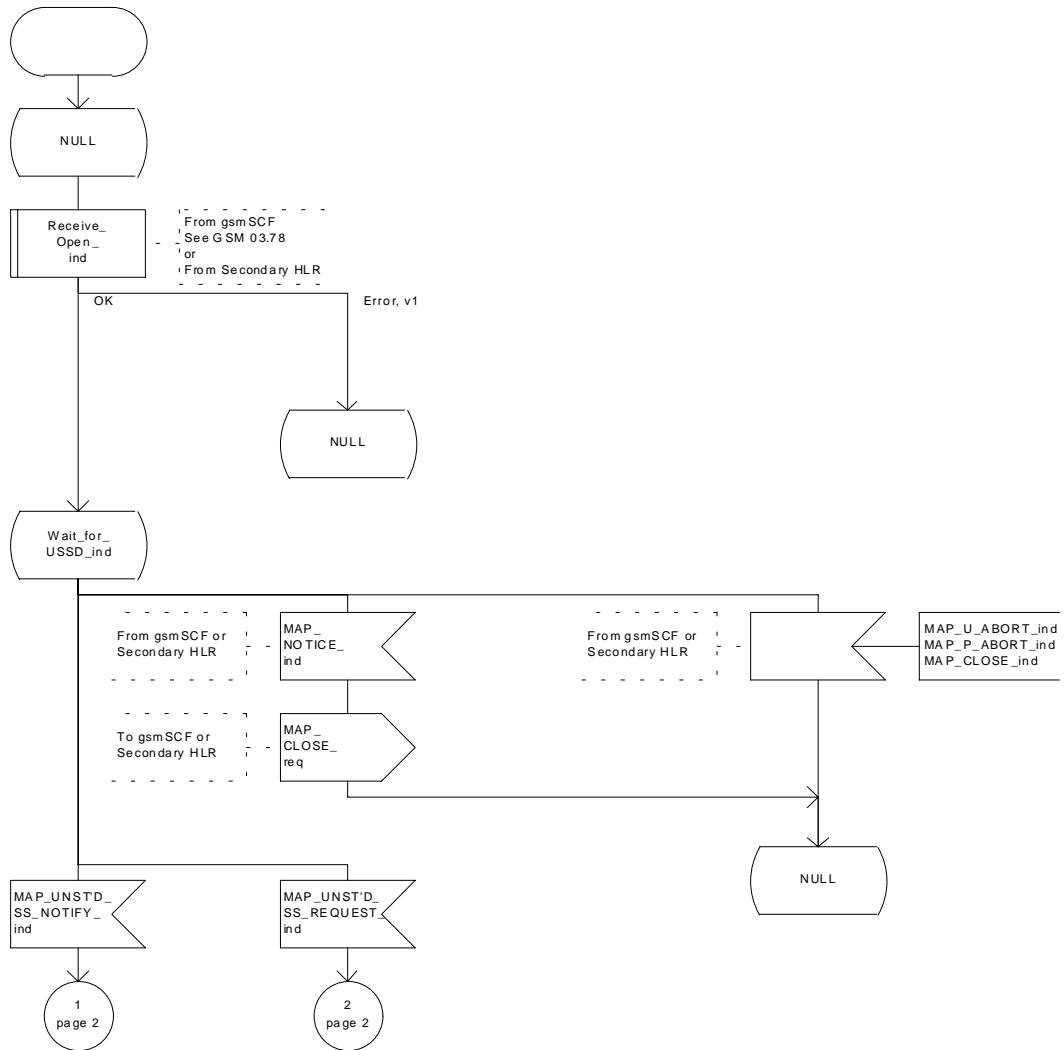


Figure 22.10.4/1 (sheet 1 of 5): Procedure NI_USSD_HLR

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR.
Arrows to right are to the next node
unless otherwise stated.

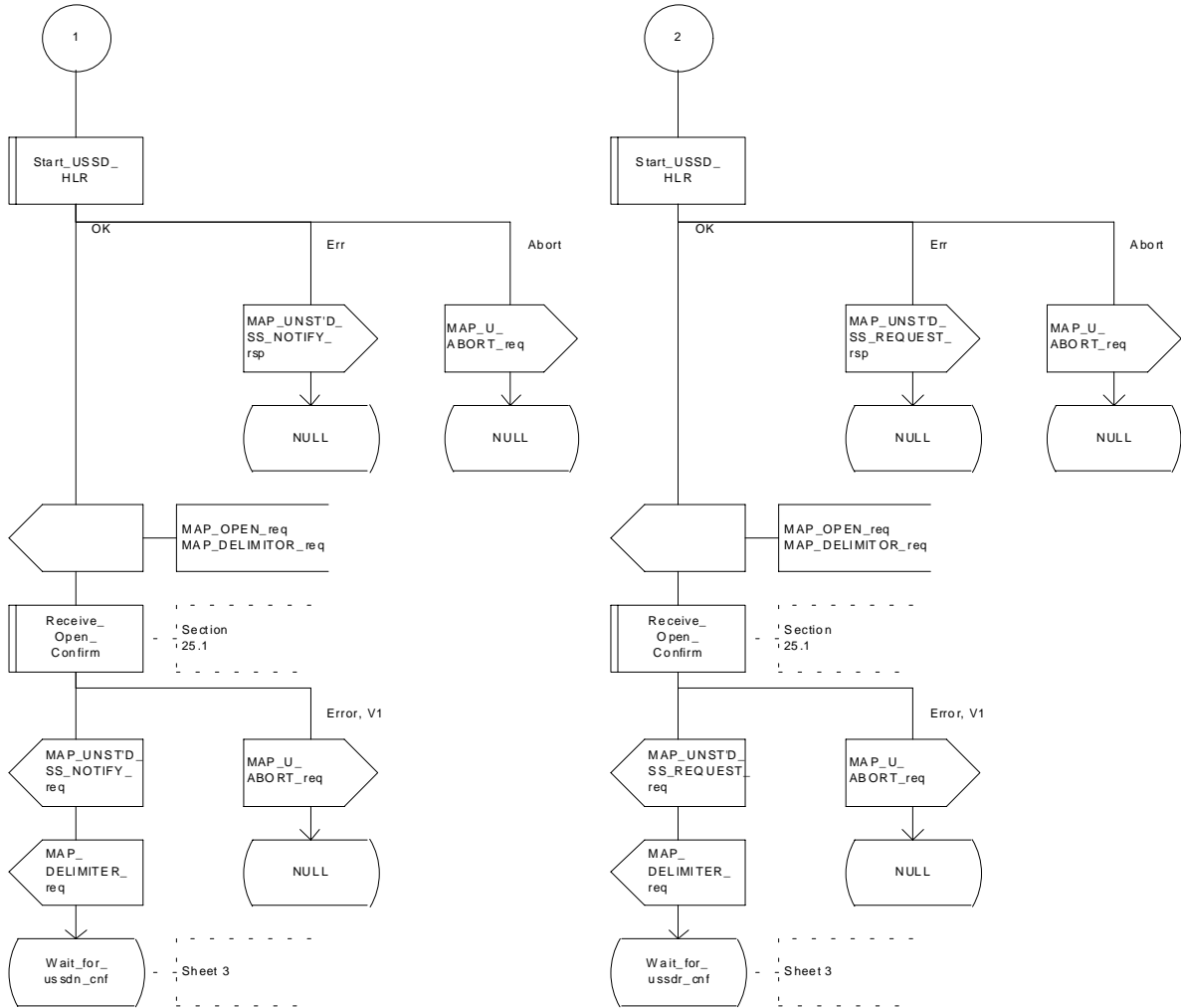


Figure 22.10.4/1 (sheet 2 of 5): Procedure NI_USSD_HLR

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR.
Arrows to right are to the next node unless otherwise stated.

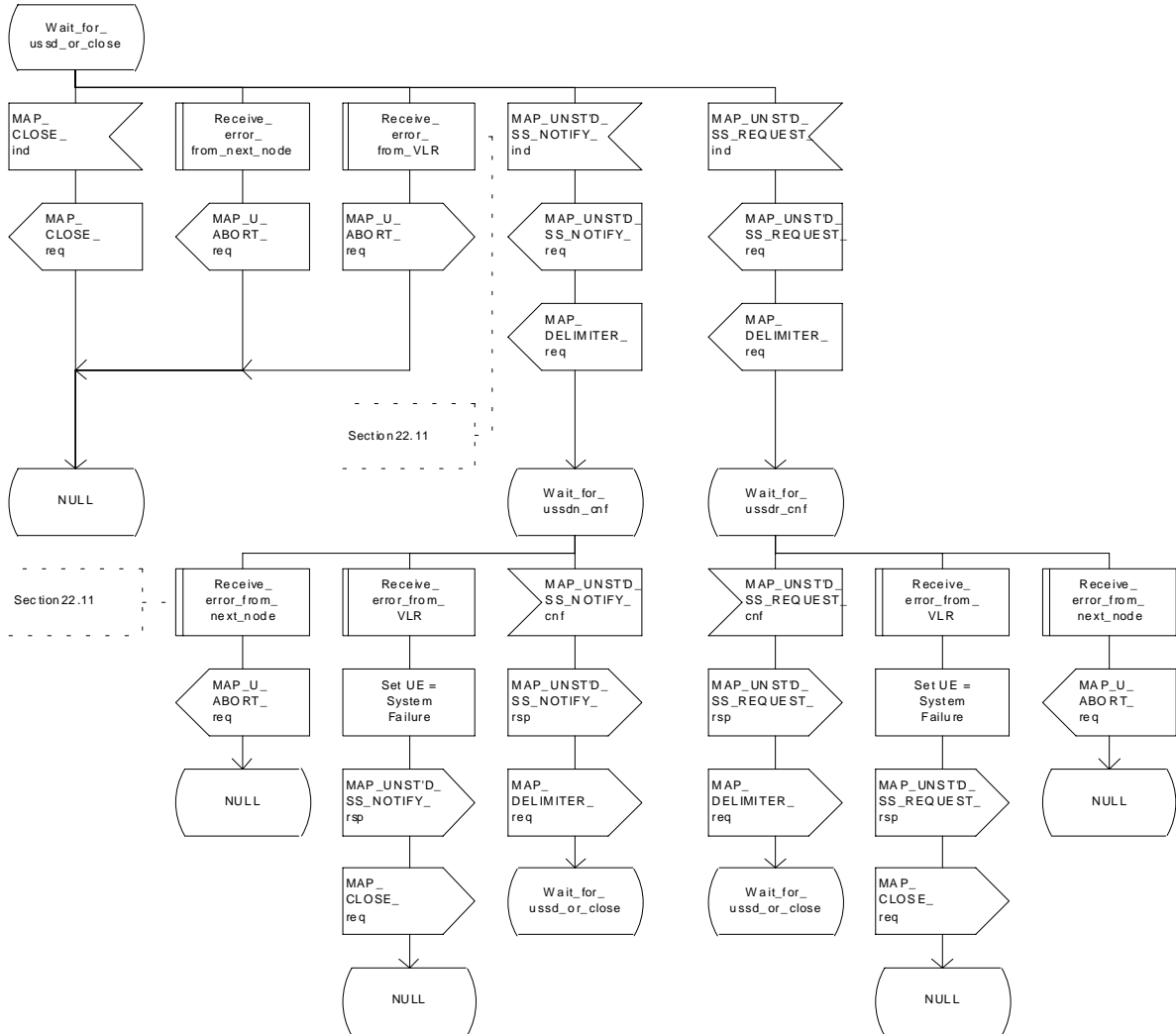


Figure 22.10.4/1 (sheet 3 of 5): Procedure NI USSD_HLR

Process NW_INIT_USSD_HLR

22.10.4_1.1(2)

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

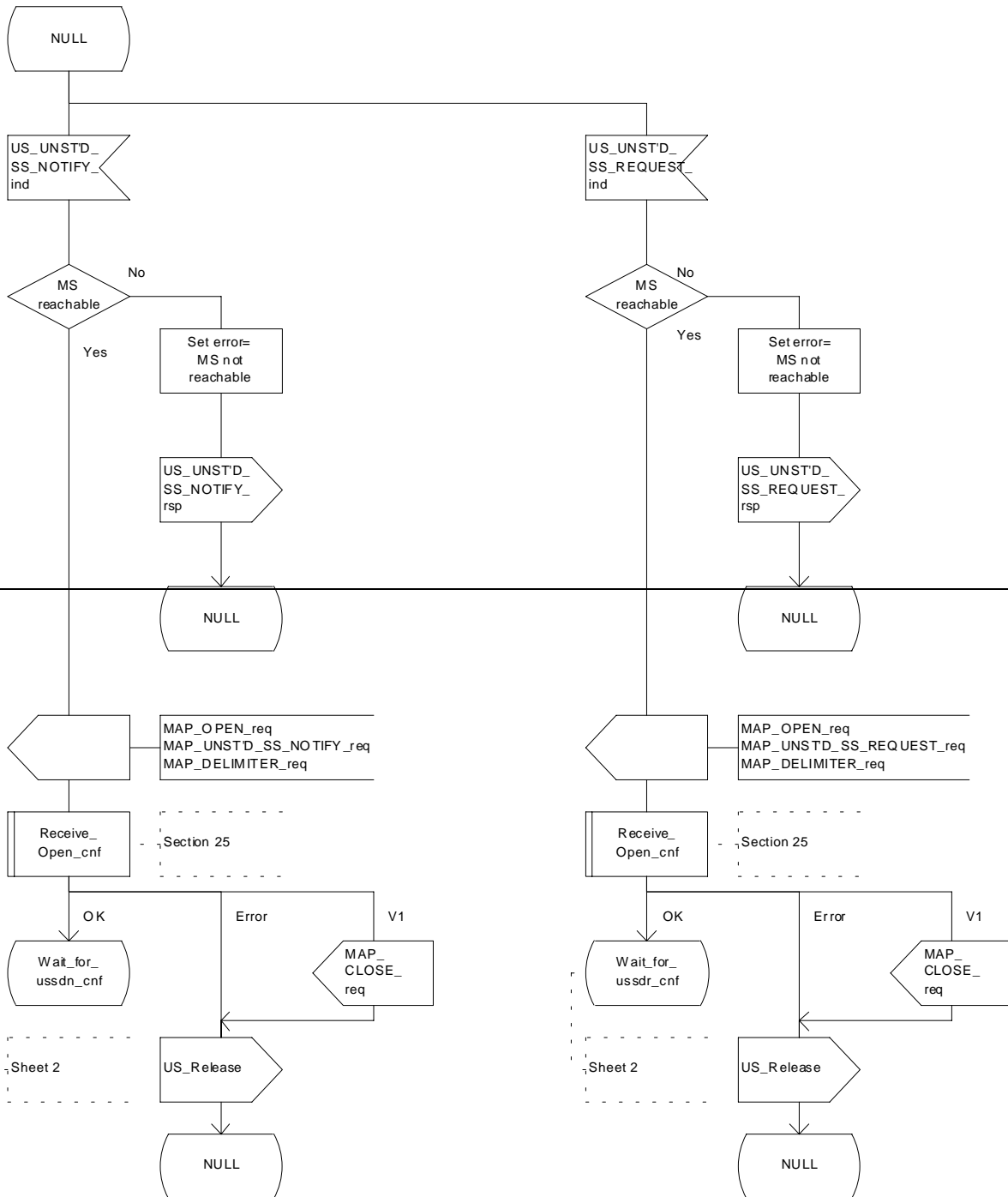


Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

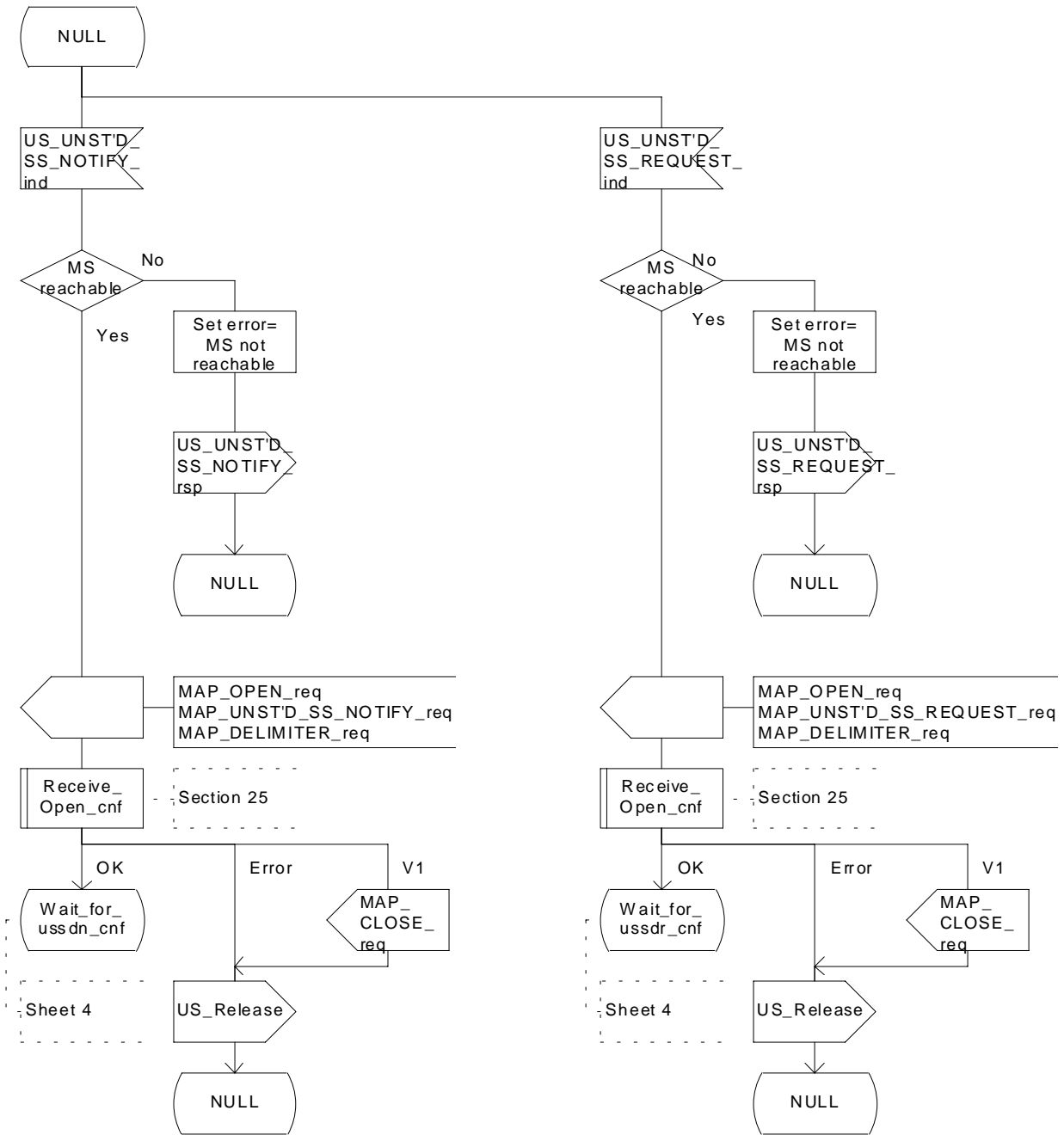


Figure 22.10.4/1 (sheet 41 of 52): Procedure NI_USSD_HLR

Process NW_INIT_USSD_HLR

22.10.4_1.2(2)

Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

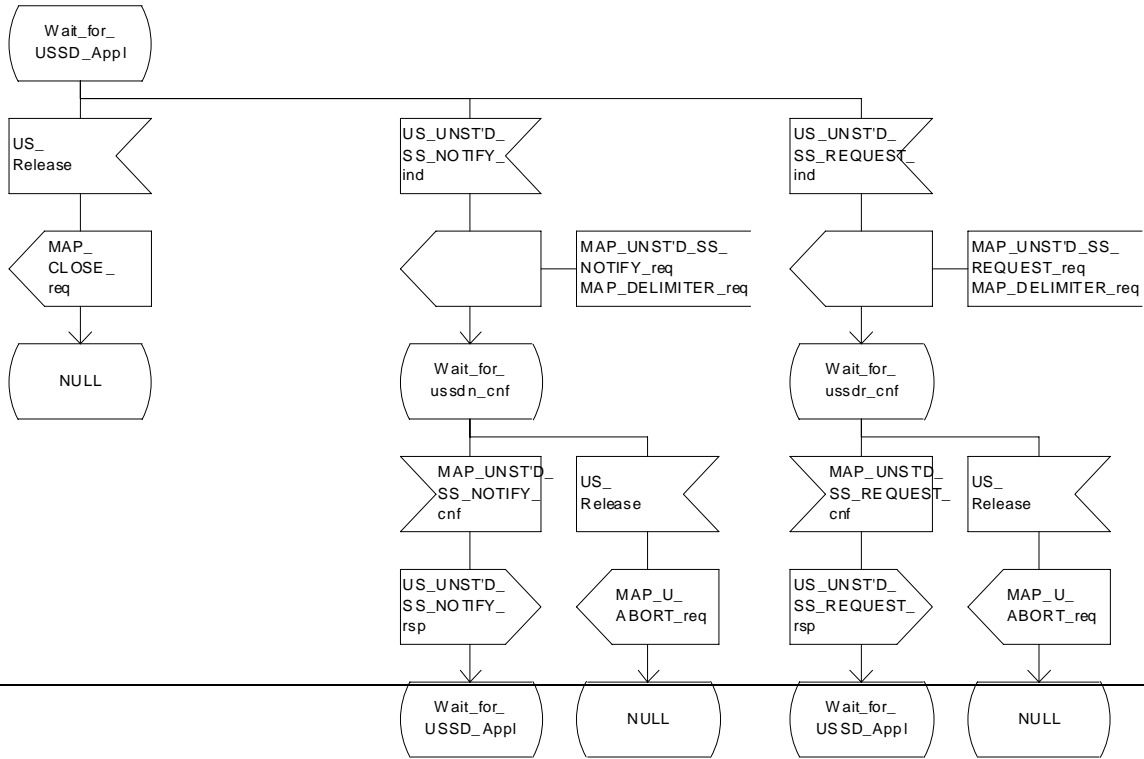


Figure 22.10.4/1 Handling of network initiated USSD at HLR

Arrows to left are to VLR, arrows to right are to USSD application unless otherwise stated.

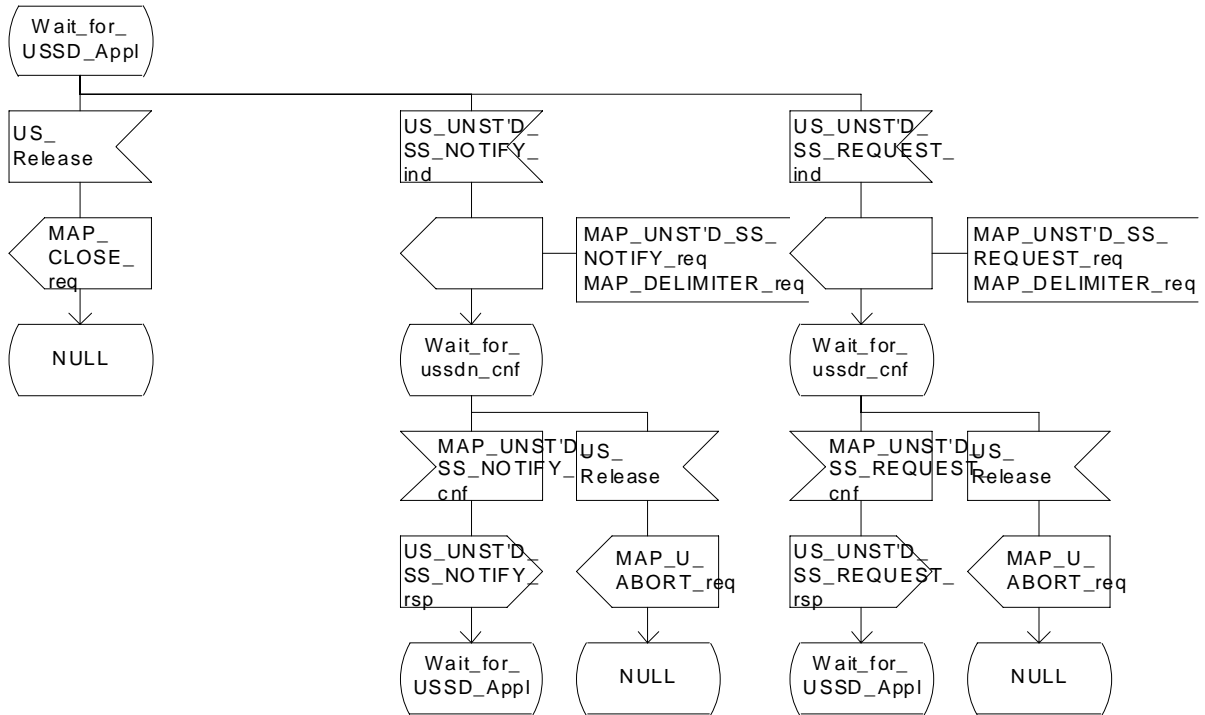


Figure 22.10.4/1 (sheet 52 of 52): Procedure NI_USSD_HLR

Figure 22.10.4/2: Macro to check MS is reachable at the HLR for a network initiated USSD operation,

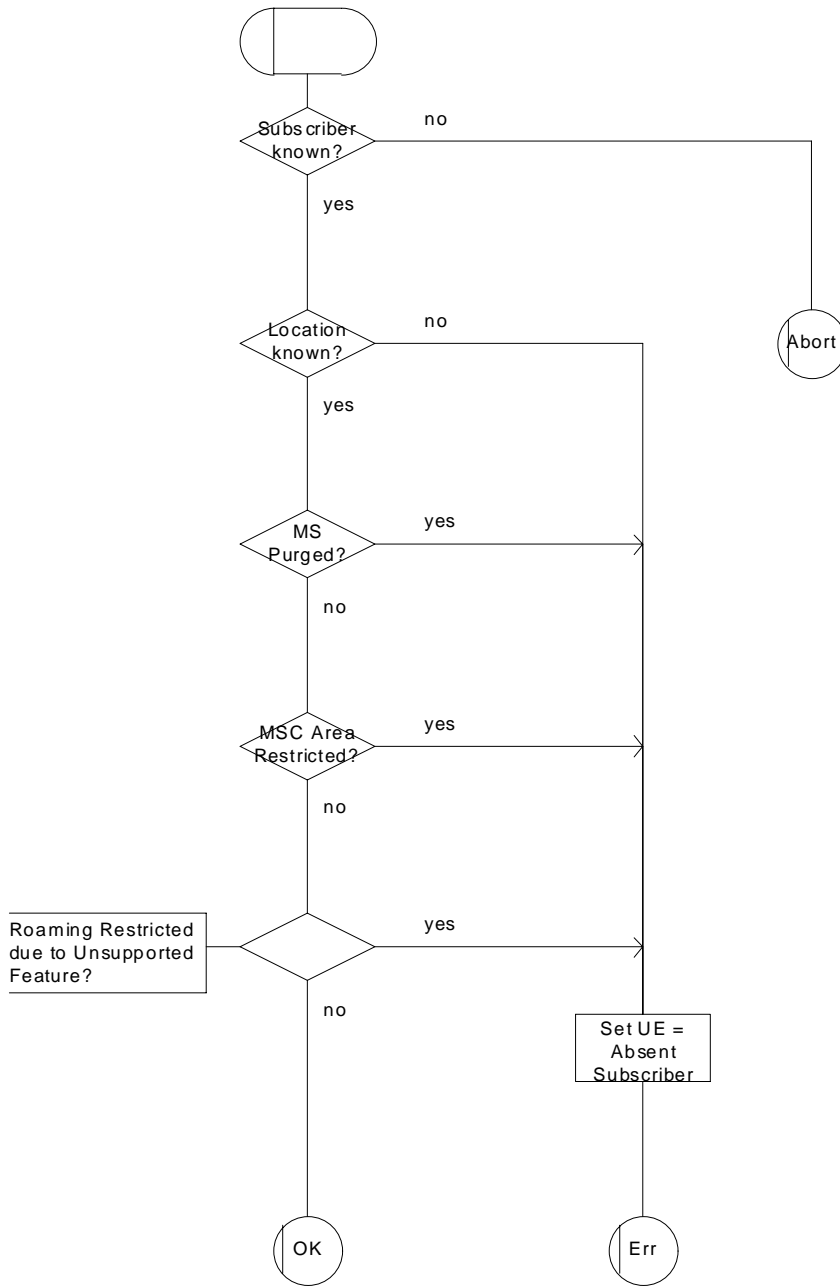


Figure 22.10.4/2: Macro Start USSD HLR

*** Next Modified Section ***

22.11.2 SS Error handling macros

Macro Receive_errors_MSC

This macro is used by the MSC to receive signals which should lead to failure if received in any state of a supplementary service process. If the air interface connection is released by the MS, the communication towards the VLR is aborted, and the MSC should return to a stable "NULL" state. If a MAP_NOTICE indication is received from the VLR, or the VLR aborts or unexpectedly closes the connection, then the air interface connection shall be released. The macro is described in figure 22.11.2/1.

Macro Receive_error_from_MSC

This macro is used by the VLR to receive signals from the MSC which should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the MSC, that connection is closed before the only outcome of the macro, "err" is reported back to the calling process. The macro is described in figure 22.11.2/2.

Macro Receive_error_from_HLR

This macro is used by the VLR to receive signals from the HLR which should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the ~~MSC~~HLR, that connection is closed. The macro is described in figure 22.11.2/3.

Macro Receive error from VLR

This macro is used by the HLR to receive signals from the VLR that should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the VLR, that connection is closed before the only outcome of the macro, "err" is reported back to the calling process. The macro is described in figure 22.11.2/4.

Macro Receive error from next node

This macro is used by the primary HLR to receive signals from the gsmSCF or secondary HLR that should lead to failure if received in any state of a supplementary service process. If a MAP_NOTICE indication is received from the next node, that connection is closed. The macro is described in figure 22.11.2/5.

*** New SDLs ***

Figure 22.11.2/4: Macro to receive errors from the VLR during supplementary services procedures in the HLR

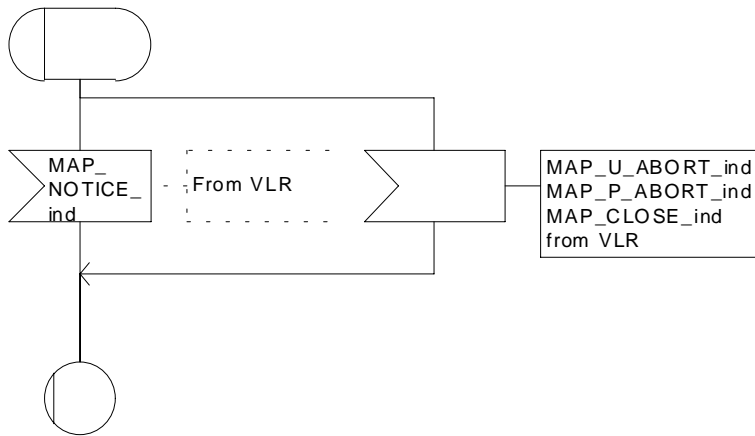


Figure 22.11.2/4: Macro Receive error from VLR

Macrodefinition Receive_error_from_next_node

22.11.2_5(1)

Figure 22.11.2/5: Macro to receive errors from the next node while the HLR is waiting for a confirmation of a supplementary service request sent to the next node

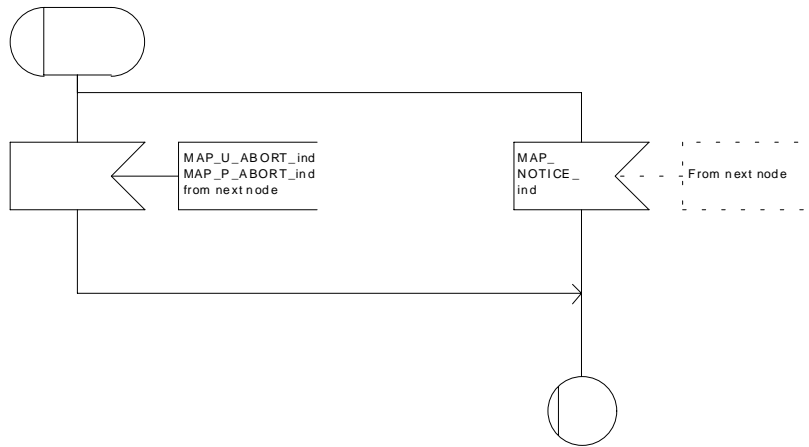


Figure 22.11.2/5: Macro Receive error from next node