3GPP TSG CN Plenary Meeting #19 **NP-030068**
12th - 14th March 2003. Birmingham, U.K.

Source:	**Vodafone Group, Lucent Technologies, L M Ericsson**
Title:	**Correction to interactions between CAMEL control of MO SMS and barring**
Agenda item:	7.1
Document for:	APPROVAL

This CR pack contains CRs against 23.078 and 29.002 which have been discussed in CN2 and CN4. The CRs against 23.078 were approved in CN2 **on the condition that the linked CRs against 29.002 were approved in CN4**. The CRs against 29.002 were discussed in CN4 and postponed for approval by email correspondence; however there were comments against the version submitted for approval by email correspondence, so the formal decision was that they were **rejected** by CN4, and as a result the CRs against 23.078 were not approved by CN2, even though there was no objection to the technical content. The CRs against 23.078 which are included in this package are identical to those which were conditionally approved in CN2.

The CRs against 29.002 were revised to take account of the comments which were raised, and the companies which raised the comments are satisfied with the revised versions; those companies (Lucent Technologies and L M Ericsson) are joint sources of this input to CN plenary. The revised versions of the CRs against 29.002 (which are part of this package) have also been distributed on the CN4 email list, and there was no objection to them.

CN are asked to approve this package of CRs to Release 99 with Release 4 and Release 5 mirror CRs (and a Release 6 mirror CR against 29.002) as an essential correction.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.078	527	1	N2-030104	R99	Correction to interactions between CAMEL control of MO SMS and barring	F	3.15.0
23.078	528	1	N2-030105	Rel-4	Correction to interactions between CAMEL control of MO SMS and barring	A	4.7.0
23.078	529	-	N2-030055	Rel-5	Correction to interactions between CAMEL control of MO SMS and barring	A	5.2.0
29.002	542	3	N4-030326rev	R99	Correction to interactions between CAMEL control of MO SMS and barring	F	3.15.0
29.002	543	2	N4-030258rev	Rel-4	Correction to interactions between CAMEL control of MO SMS and barring	A	4.10.0
29.002	544	2	N4-030259rev	Rel-5	Correction to interactions between CAMEL control of MO SMS and barring	A	5.4.0
29.002	545	2	N4-030260rev	Rel-6	Correction to interactions between CAMEL control of MO SMS and barring	A	6.0.0

3GPP TSG CN WG2 Meeting #28 ***N2-030055***
Dublin, EIRE, 10th – 14th February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** **529** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone
Work item code:	⌘	CAMEL3
Date:	⌘	29/01/2003
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This introduces a new procedure, CAMEL_MO_SMS_VLR, which is called from the main process (which is described in TS 29.002 clause 23)
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly, which can lead to complaints from subscribers about SMS submission not working when it should, or working (and being charged for) when it should not.

Clauses affected:	⌘	7.5.2A (new)			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	CR 29.002-544
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

**** First modified section ****

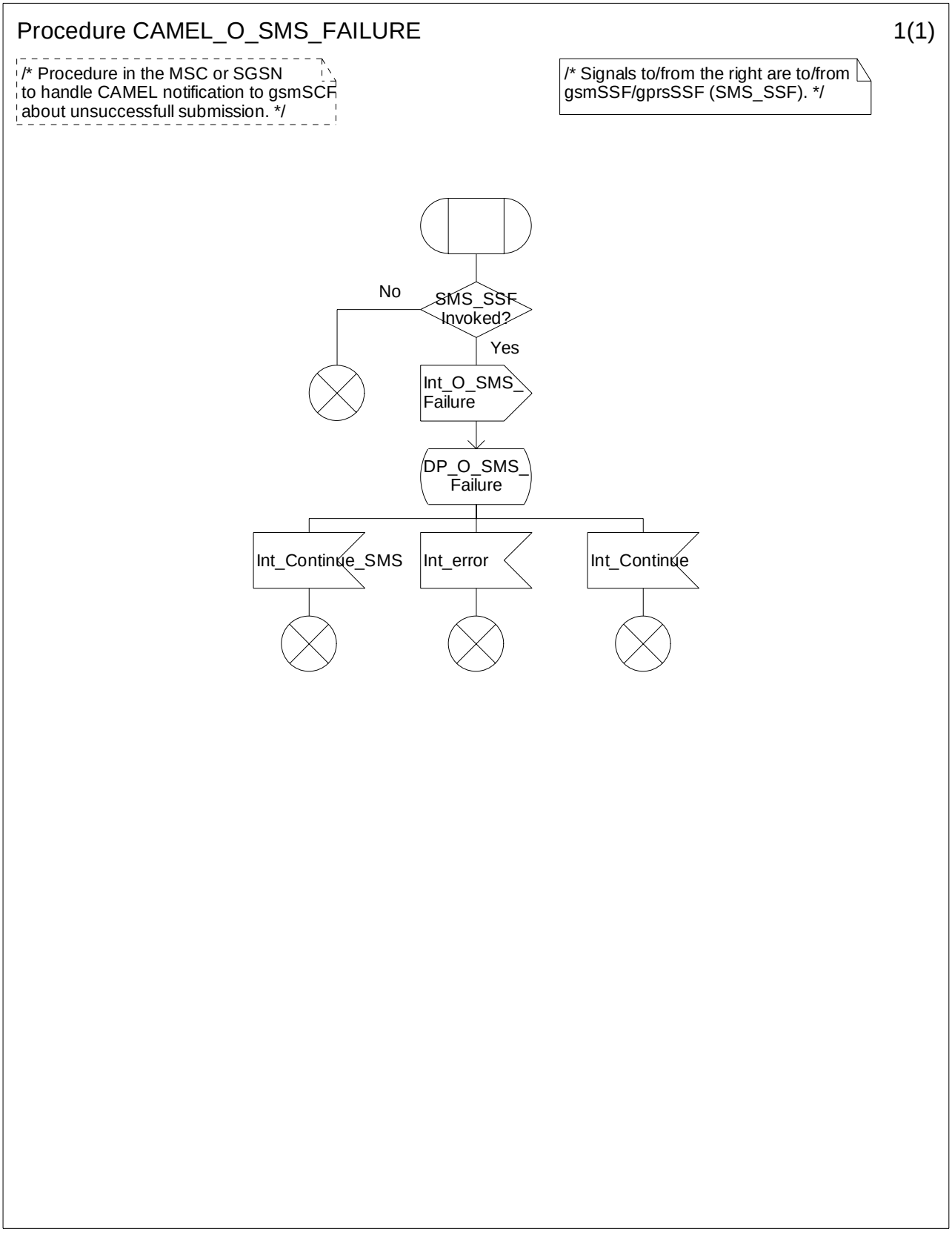


Figure Error! Reference source not found.**.1-1: Procedure CAMEL_O_SMS_FAILURE (sheet 1)**

7.5.2A Handling of mobile originating SMS in the VLR

The functional behaviour of the VLR is specified in 3GPP TS 29.002 [32]. The handling specific to CAMEL is specified in the following procedure:

- Procedure CAMEL_MO_SMS_VLR.

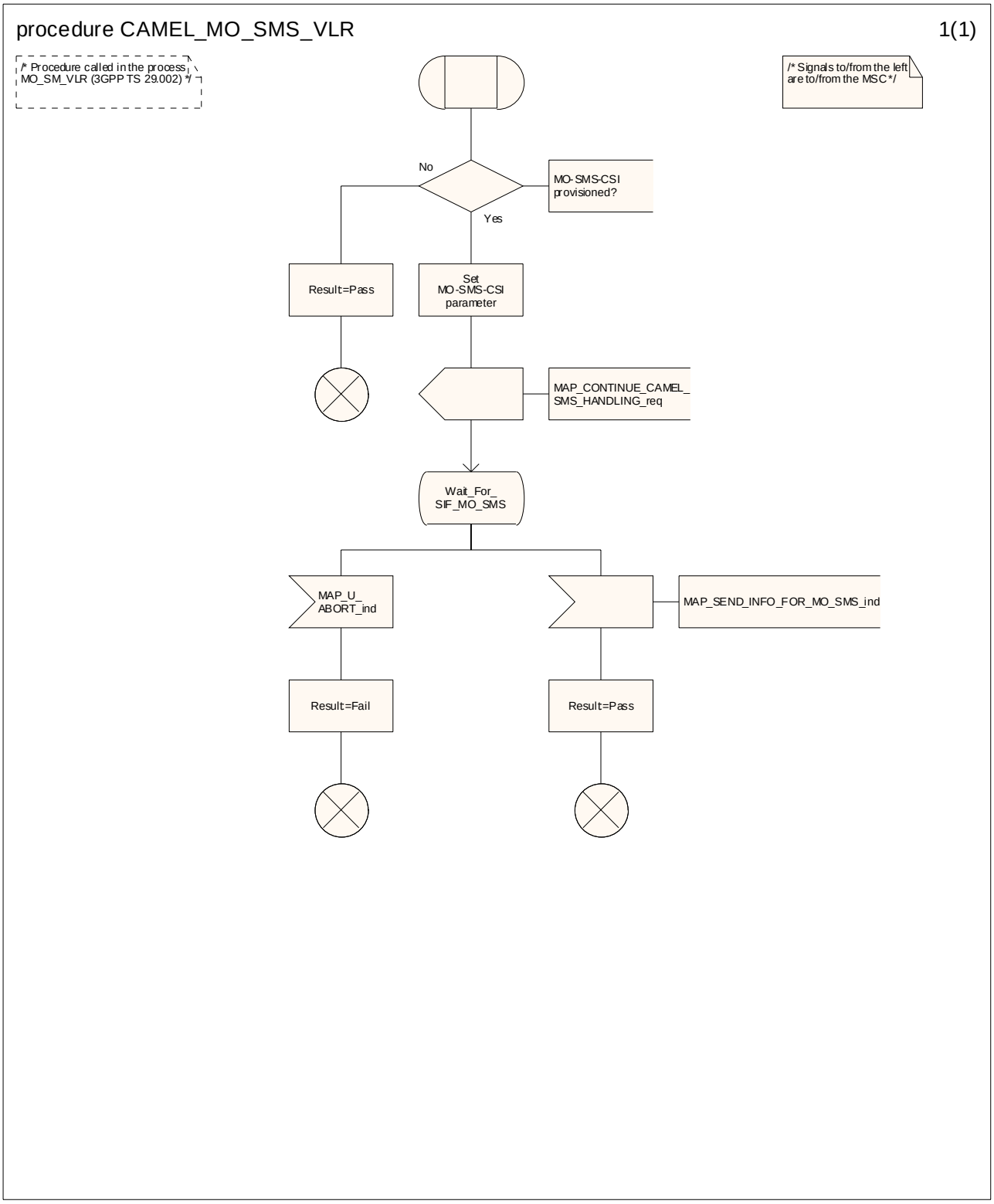


Figure 7.7A-1: Procedure CAMEL_MO_SMS_VLR (sheet 1)

7.5.3 Functional architecture for CAMEL MT SMS services

****** End of document ******

3GPP TSG CN Plenary Meeting #19
Birmingham, UK, 12th – 14th March 2003 **(Revision of N4-030260)**

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **545** ⌘ **rev** **2** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone, Lucent Technologies, L M Ericsson
Work item code:	⌘	CAMEL3
Date:	⌘	21/02/2003
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This requires changes to the processes MO_SMS_MSC and MO_SMS_VLR (text and SDL descriptions). Reflect the sequence of checking: BAOC (both ODB and SS in the MSC/VLR, ODB only in the SGSN); CAMEL handling; BOIC/BOIC-exHC (both ODB and SS in the MSC/VLR, ODB only in the SGSN), to reflect the description in 23.078.
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly, which can lead to complaints from subscribers about SMS submission not working when it should, or working (and being charged for) when it should not.

Clauses affected:	⌘	23.2.1, 23.2.2, 23.2.4

Other specs affected:	⌘	Y	N		⌘
		X		Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	The pretence of MAP dialogues between the MSC and the VLR leads to unnecessary complexity in the SDL diagrams (handling for MAP_NOTICE and MAP_P_ABORT, possibility of protocol version dropback). This has been removed, as a small step in the right direction. A text box has been added to each sheet of SDL which needs it, to state the convention for the source and destination of input and output signals. This has not been highlighted in the SDL diagrams.

**** First modified section ****

23.2.1 Procedure in the servicing MSC

Any CAMEL-specific handling defined in this subclause is omitted if the MSC does not support CAMEL control of MO SMS or if the subscriber does not have a subscription for CAMEL control of MO SMS.

~~The activation of the MAP_PROCESS_ACCESS_REQUEST service is described in the clause 25.4.1.~~

When the MSC receives~~ing~~ the short message from the A-interface, ~~the MSC~~it sends ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS request to the VLR~~. As~~ and waits for a response. While the MSC is waiting for a response from the VLR:

~~- if it receives a Release indication from the A-interface, it aborts the dialogue with the VLR, and the process terminates;~~

- if the VLR aborts, or prematurely closes, the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with error cause "Network out of order" to the MS, and the process terminates;

- if it receives a MAP_CONTINUE_CAMEL_SMS_HANDLING indication, it checks the indication.

  - if the indication is badly formed, the MSC sends an A_RP_ERROR with error cause "Network out of order" to the MS and aborts the dialogue with the VLR, and the process terminates;

  - if the indication is OK, the MSC calls the procedure CAMEL_O_SMS_INIT and tests the result.

    - if the result was "SMS_Aborted", the MSC aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Release_SMS", the MSC returns an A_RP_ERROR with an error cause as instructed by the gsmSCF to the MS and aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Redirect SMS", the MSC modifies the data for the submitted short message as instructed by the gsmSCF, sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress-O-CSI set~~ and waits for a response;

    - if the result was "Continue", the MSC sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress-O-CSI set~~ and waits for a response. The handling for this request is shown in the procedure CAMEL_MO_SMS_VLR (see 3GPP TS 23.078 [98]).

- if it ~~will~~ receives ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS confirmation from VLR, it checks the confirmation. ~~indicating that:~~

  - if the confirmation includes an error, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

  - if the confirmation indicates a successful result, the MSC checks whether the MSC is also the SMS-IWMSC.

    - if the MSC is separate from the SMS-IWMSC, MSC handling continues as described below under the heading "Serving MSC is separate from SMS-IWMSC".

    - if the MSC is also the SMS-IWMSC, the MSC handling continues as described below under the heading "Serving MSC is SMS-IWMSC";

Serving MSC is separate from SMS-IWMSC

The MSC checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;

  - if the dialogue opening is successful, the MSC waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the two requests cannot be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

- if the dialogue opening is successful, the MSC sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol, and checks the result.

  - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the MSC receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the confirmation indicates that the submission of the short message failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

~~- if the MSC receives a Release indication from the A interface, it aborts the dialogue with the SMS-IWMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the dialogue with the SMS-IWMSC fails, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates.

Serving MSC is SMS-IWMSC

The MSC sends an SC_RP_MO_DATA request to the Short Message Service Centre (SMSC), and waits for the response.

~~- if the MSC receives a Release indication from the A interface, it aborts the dialogue with the SMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the MSC receives an error response from the SMSC, it reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

- if the SMSC aborts the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the MSC receives a positive response from the SMSC, it reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates.

- ~~the service ends successfully. If the MSC is not itself the IWMSC, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request;~~

- ~~the service ends unsuccessfully. The error cause in the MAP_SEND_INFO_FOR_MO_SMS confirmation indicates the reason for the unsuccessful end. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26].~~

~~If there are data errors in the MAP_SEND_INFO_FOR_MO_SMS confirmation, or there is an operation failure in MAP, the RP_ERROR cause network out of order is forwarded to the mobile station.~~

~~The MSC opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS.~~

~~The MSC checks the barring as follows;~~

- ~~if the short message transfer would contravene operator determined barring, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause operator barring is returned to MS;~~

- ~~if the short message transfer would contravene the supplementary service call barring conditions, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause barring service active is returned to MS.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the MSC will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation. If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing MSC will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

- ~~the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

- ~~one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in the SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

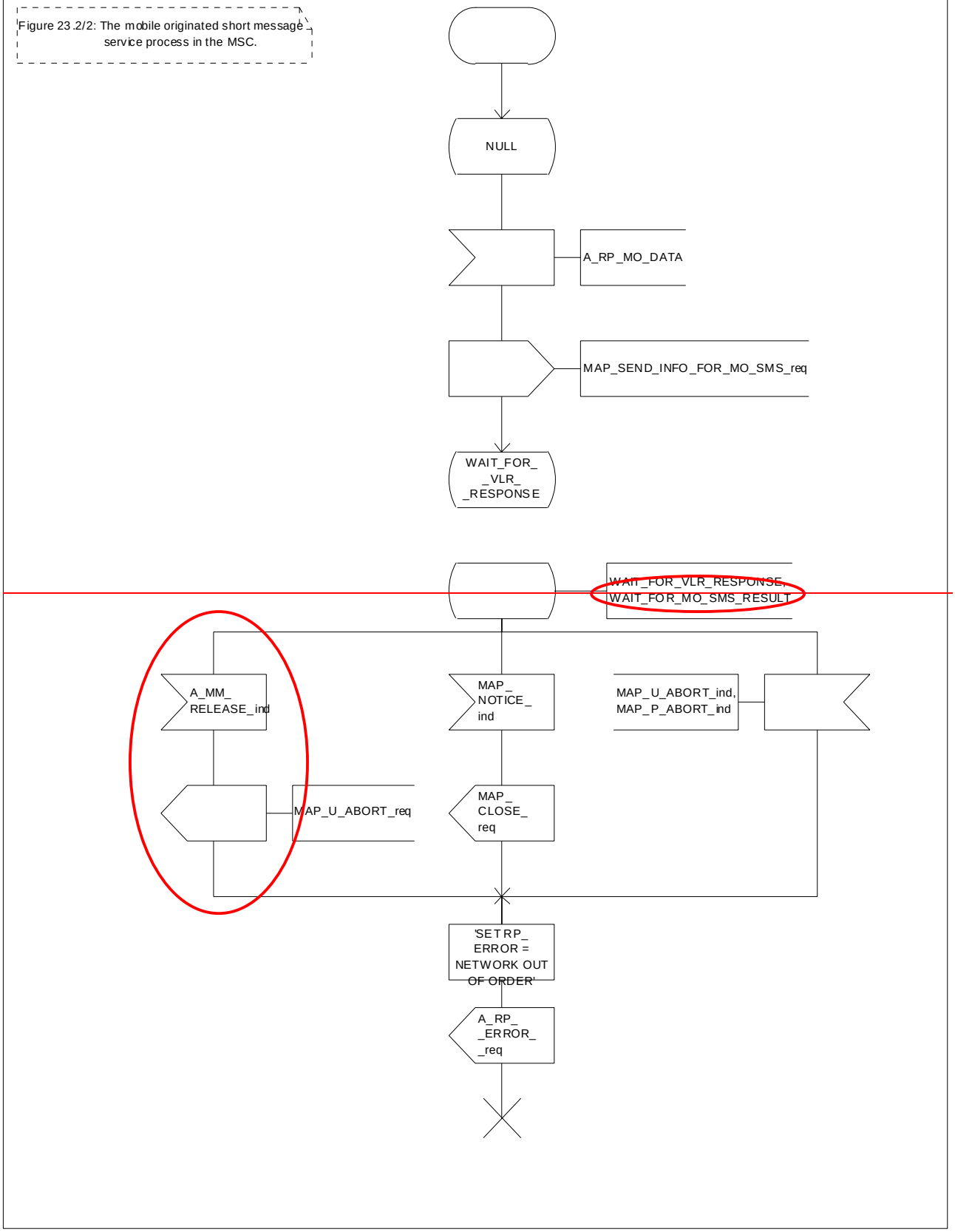
~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

~~If the MSC itself is the interworking MSC, the short message is forwarded to the Service Centre. In that case the service MAP_MO_FORWARD_SHORT_MESSAGE is not initiated. The acknowledgement message from the Service Centre is forwarded to the mobile station (3GPP TS 23.040[26], 3GPP TS 24.011 [37]).~~

The mobile originated short message service proces~~sdure~~ in the MSC is shown in figure 23.2/2.

Process MOSM_MSC 23.2_2.1(3)

Figure 23.2/2: The mobile originated short message service process in the MSC.



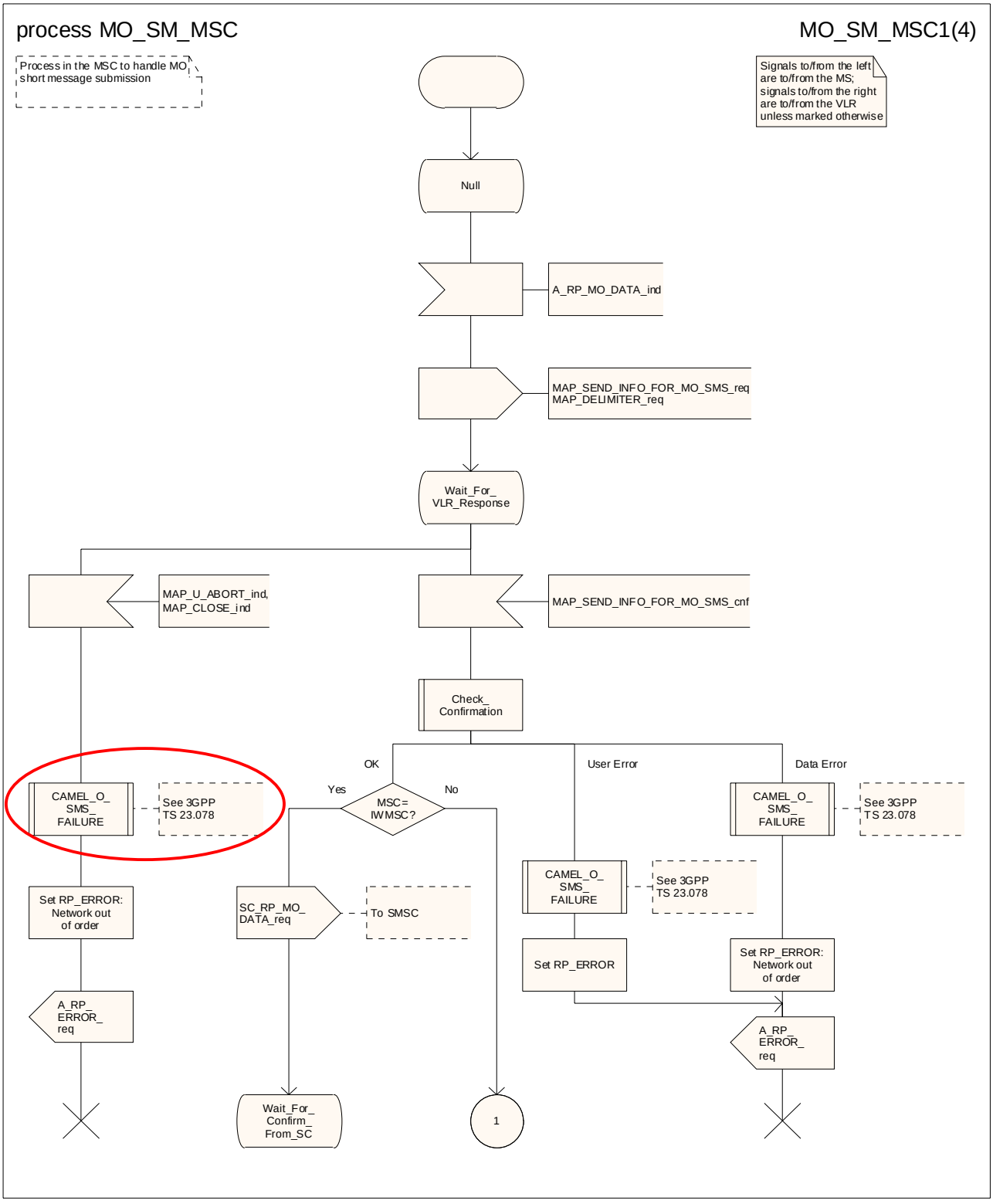
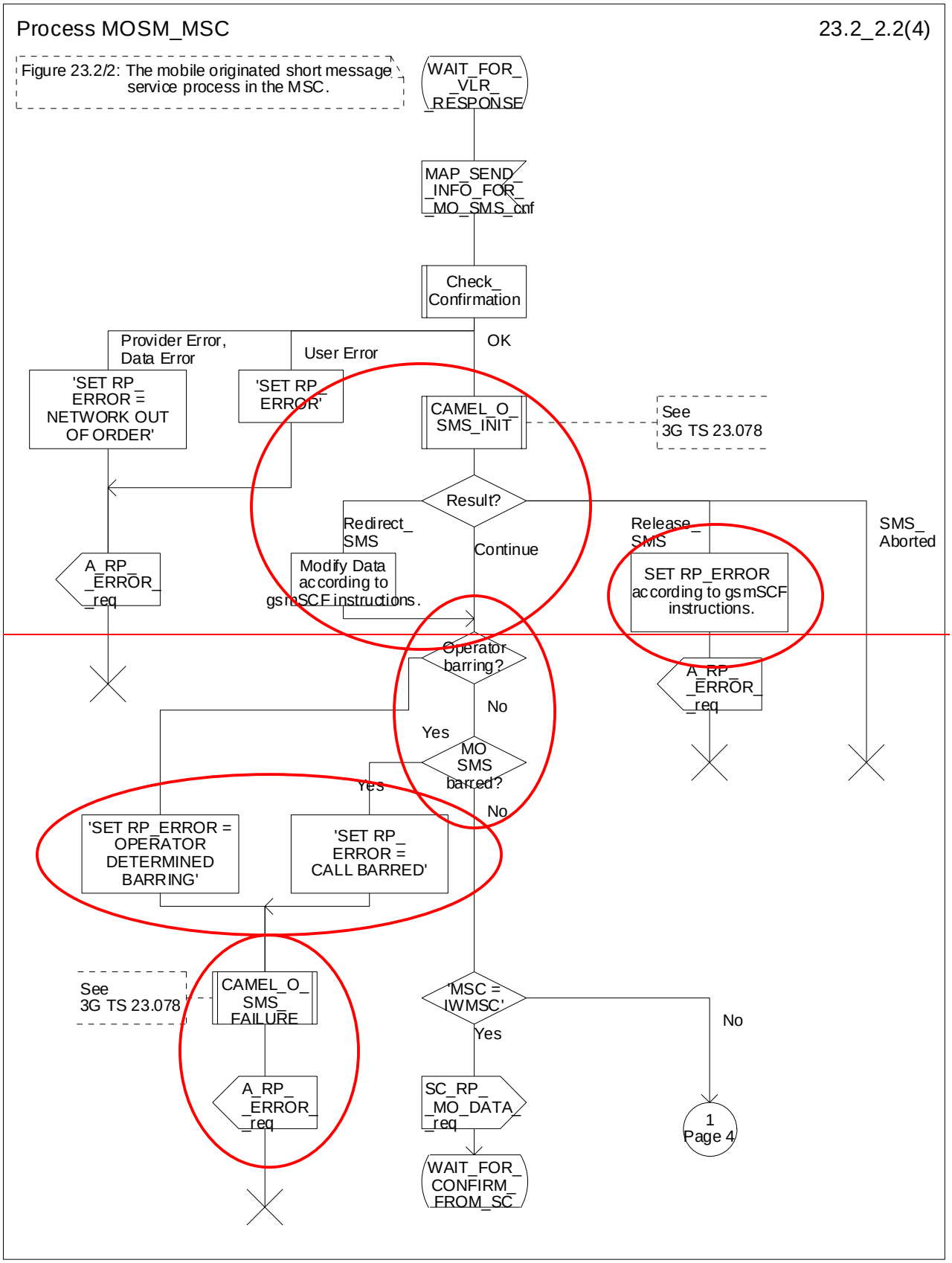


Figure 23.2/2 (sheet 1 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.2(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
WAIT_FOR_VLR_RESPONSE
MAP_SEND_INFO_FOR_MO_SMS_cnf
Check_Confirmation
Provider Error, Data Error
User Error
OK
'SET RP_ERROR = NETWORK OUT OF ORDER'
'SET RP_ERROR'
CAMEL_O_SMS_INIT
See 3G TS 23.078
Result?
Redirect_SMS
Continue
Release_SMS
SMS_Aborted
A_RP_ERROR_req
Modify Data according to gsmSCF instructions.
SET RP_ERROR according to gsmSCF instructions.
Operator barring?
No
Yes
MO SMS barred?
Yes
No
'SET RP_ERROR = OPERATOR DETERMINED BARRING'
'SET RP_ERROR = CALL BARRED'
See 3G TS 23.078
CAMEL_O_SMS_FAILURE
A_RP_ERROR_req
'MSC = IWMSC'
No
Yes
SC_RP_MO_DATA_req
WAIT_FOR_CONFIRM_FROM_SC
1
Page 4

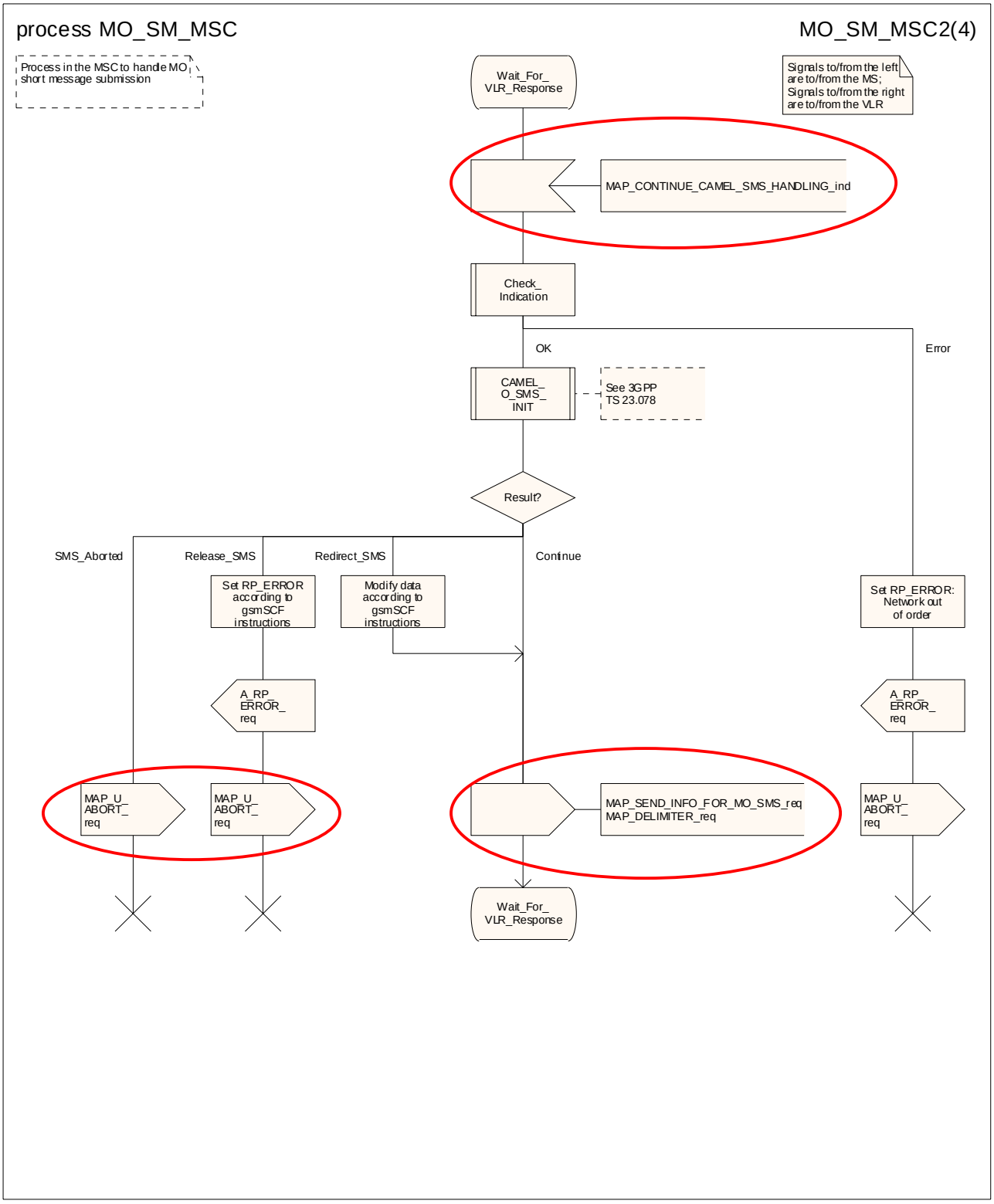
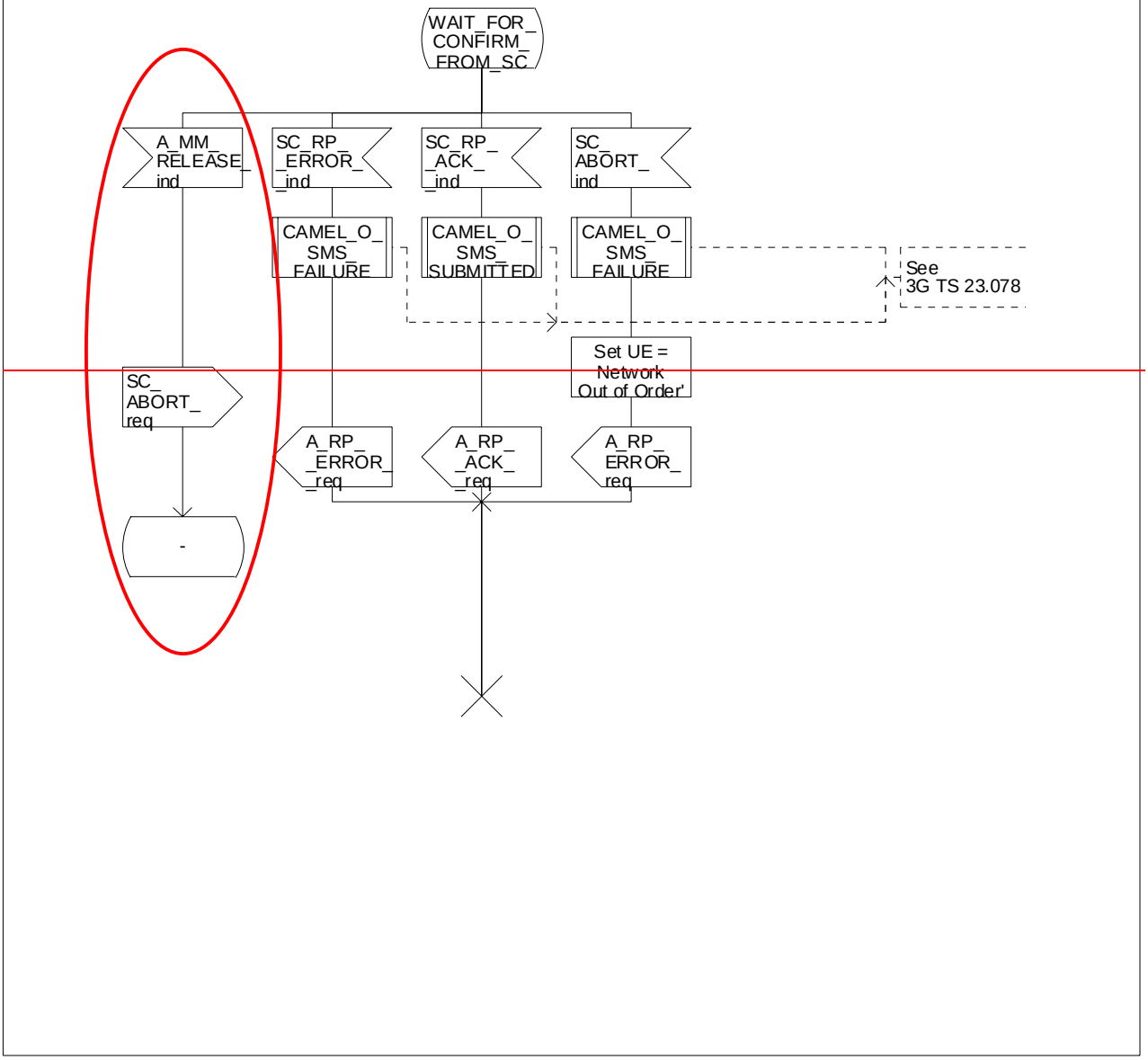


Figure 23.2/2 (sheet 2 of 4): Process MO_SM_MSC

Process MOSM_MSC 23.2_2.new3(4)

Figure 23.2/2: The mobile originated short message service process in the MSC.



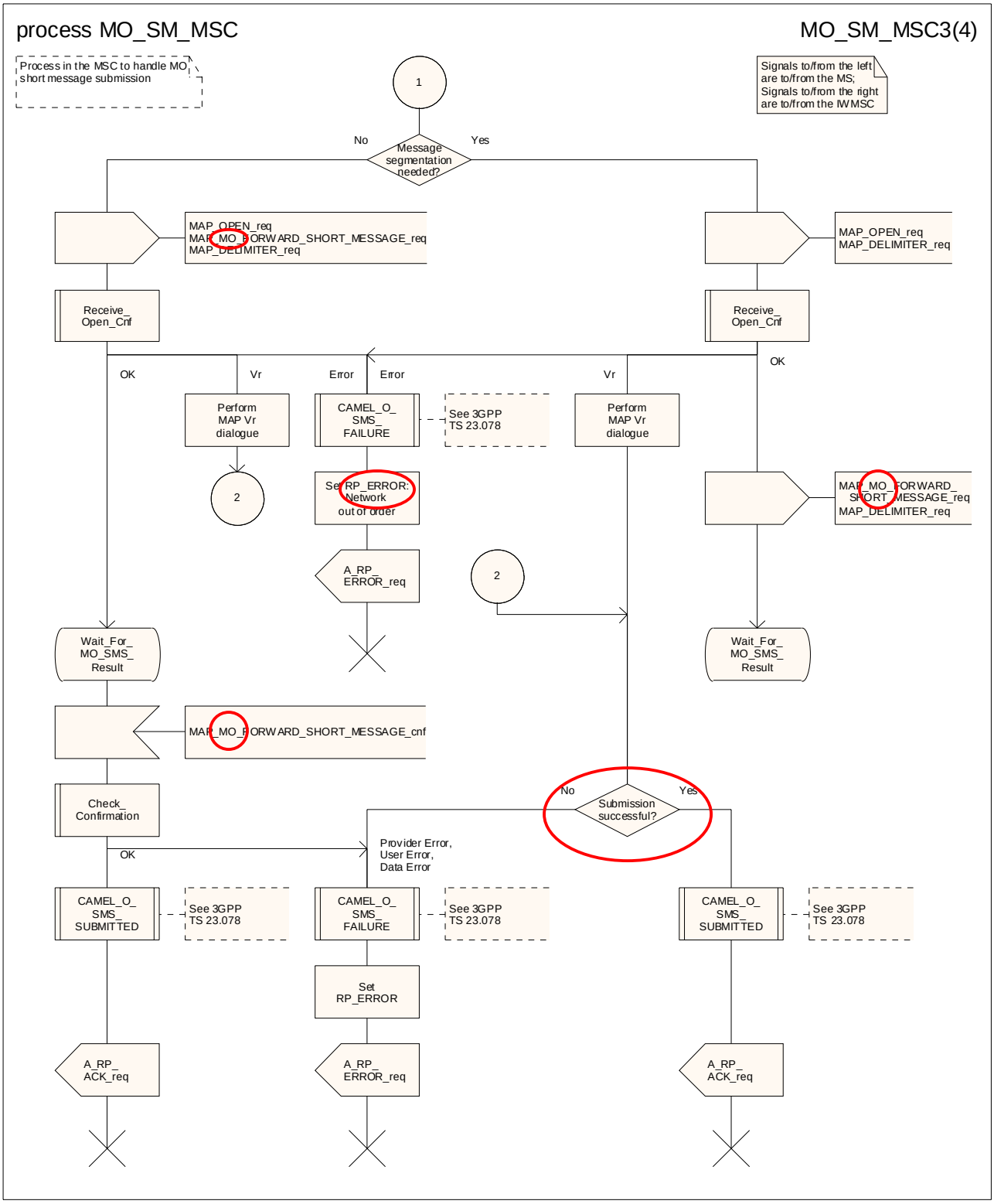
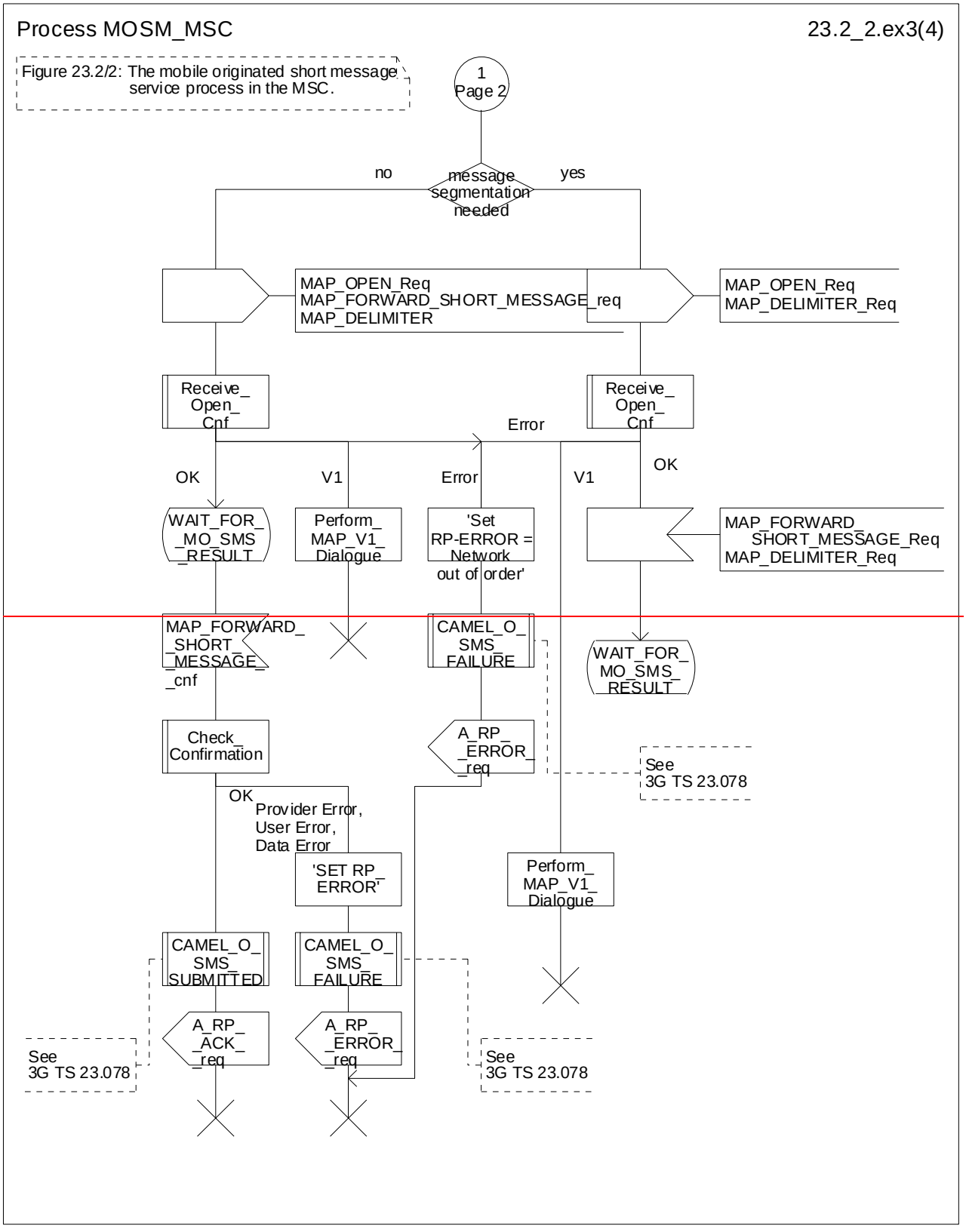


Figure 23.2/2 (sheet 3 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.ex3(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
1
Page 2
no
message segmentation needed
yes
MAP_OPEN_Req
MAP_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
V1
Error
V1
OK
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_V1_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_FORWARD_ _SHORT_ _MESSAGE_ _cnf
CAMEL_O_ SMS_ FAILURE
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
A_RP_ _ERROR_ _req
See 3G TS 23.078
OK
Provider Error, User Error, Data Error
'SET RP_ ERROR'
Perform_ MAP_V1_ Dialogue
CAMEL_O_ SMS_ SUBMITTED
CAMEL_O_ SMS_ FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req
See 3G TS 23.078
See 3G TS 23.078

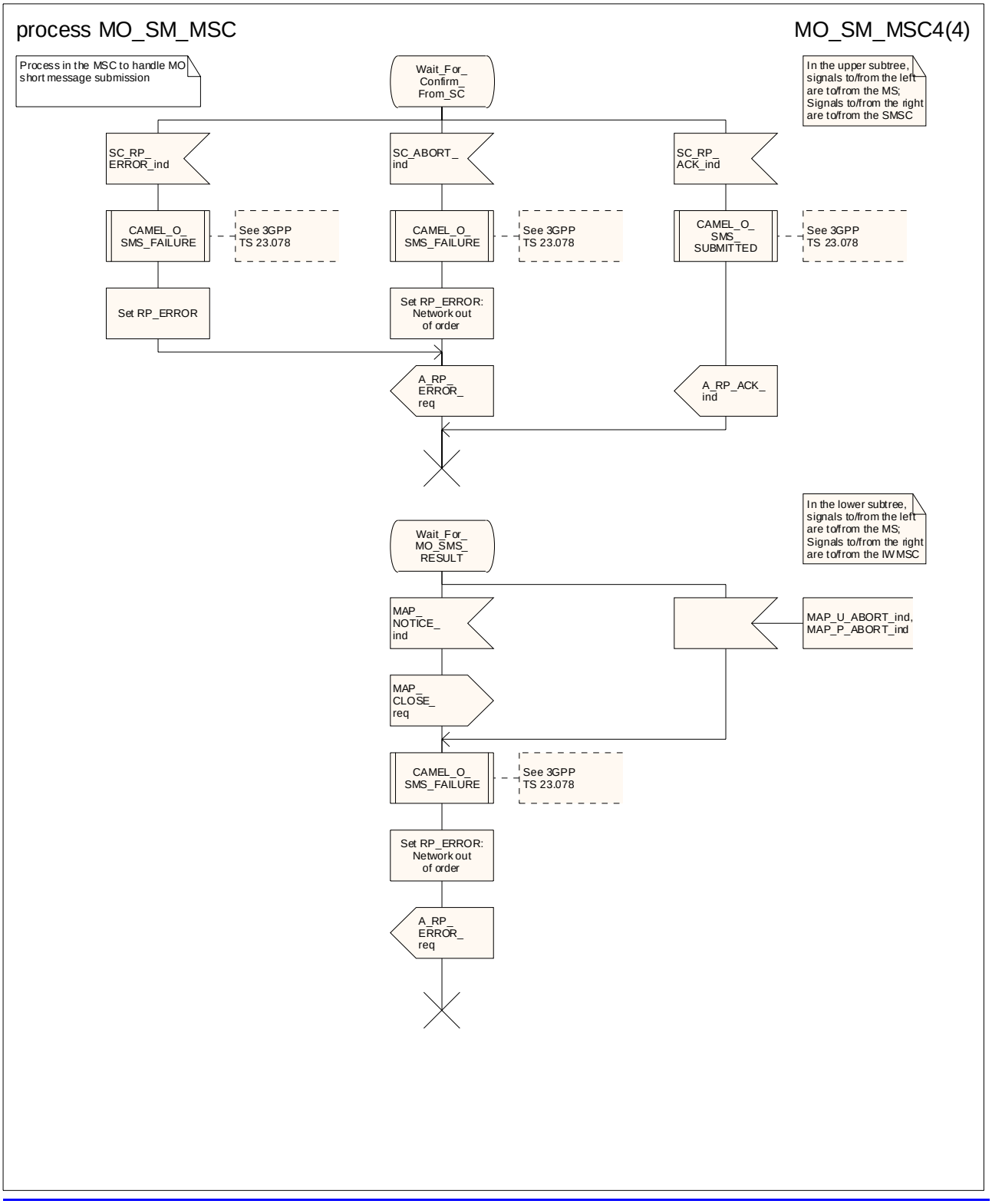


Figure 23.2/2 (sheet 4 of 4): Process MO_SM_MSC

23.2.2 Procedure in the VLR

Any CAMEL-specific handling defined in this subclause is omitted if the VLR does not support CAMEL control of MO SMS.

The process is triggered by a dialogue opening request followed by a MAP_PROCESS_ACCESS_REQUEST including a CM service type Short Message Service.

If the macro Process_Access_Request_VLR takes the "OK" exit, the VLR waits for a MAP_SEND_INFO_FOR_MO_SMS indication from the MSC.

- If the MSC aborts the dialogue, the process returns to the Null state;
- if the indication is badly formed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the appropriate user error;
- if the indication is OK, the VLR checks whether the submission of the short message is allowed
  - if MO SMS is not provisioned, VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Teleservice not provisioned";
  - if the submission of the short message is prevented by Operator Determined Barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by supplementary service barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - the VLR calls the procedure CAMEL_MO_SMS_VLR and checks the result.
    - if the result is "Fail", the process returns to the Null state;
    - if the result is "Pass", the VLR continues to check the subscription information.
  - if the submission of the short message is prevented by Operator Determined Barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by ~~the Barring~~ supplementary service barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - if the submission of the short message is allowed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the MSISDN of the requesting subscriber..

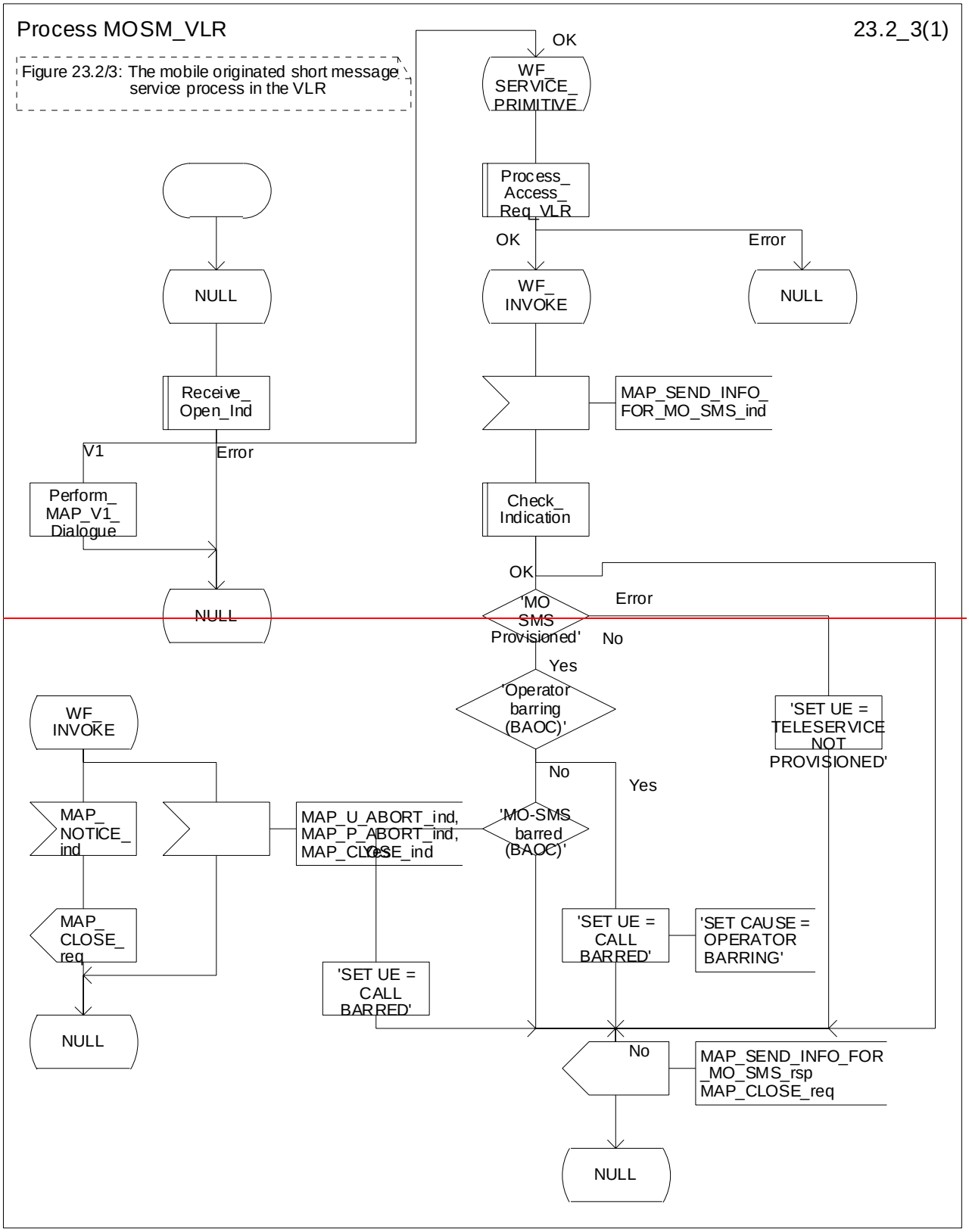
When the VLR has returned the MAP_SEND_INFO_FOR_MO_SMS response, the process returns to the Null state.

~~The MAP_PROCESS_ACCESS_REQUEST indication starts the MAP_PROCESS_ACCESS_REQUEST service in the VLR. The application context in the MAP_OPEN indication is mobile originated short message transfer.~~

~~If the service MAP_PROCESS_ACCESS_REQUEST is successful, the VLR waits for the next message from the MSC. When receiving the MAP_SEND_INFO_FOR_MO_SMS indication, the VLR acts as follows:~~

- ~~if there is incompatibility in the subscription check, the error teleservice not provisioned is returned to the MSC;~~
- ~~if the short message transfer would contravene Operator determined Barring (BAOC), the call barred error with cause operator barring is returned;~~
- ~~if the short message transfer would contravene the supplementary service call barring conditions (BAOC)in the VLR, the call barred error with cause barring service active is returned.~~

~~When the mobile subscriber has passed all checks, the MAP_SEND_INFO_FOR_MO_SMS response is initiated and the procedure is terminated in the VLR.~~ The mobile originated short message transfer process~~dure~~ in the VLR is shown in figure 23.2/3.


Process MOSM_VLR
23.2_3(1)
Figure 23.2/3: The mobile originated short message service process in the VLR
OK
WF_ SERVICE_ PRIMITIVE
Process_ Access_ Req_VLR
OK
Error
NULL
WF_ INVOKE
NULL
Receive_ Open_Ind
MAP_SEND_INFO_ FOR_MO_SMS_ind
V1
Error
Perform_ MAP_V1_ Dialogue
Check_ Indication
OK
NULL
'MO SMS Provisioned'
Error
No
Yes
'Operator barring (BAOC)'
WF_ INVOKE
'SET UE = TELESERVICE NOT PROVISIONED'
No
Yes
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind, MAP_CLOSE_ind
'MO-SMS barred (BAOC)'
MAP_ CLOSE_ req
'SET UE = CALL BARRED'
'SET UE = CALL BARRED'
'SET CAUSE = OPERATOR BARRING'
NULL
No
MAP_SEND_INFO_FOR _MO_SMS_rsp MAP_CLOSE_req
NULL

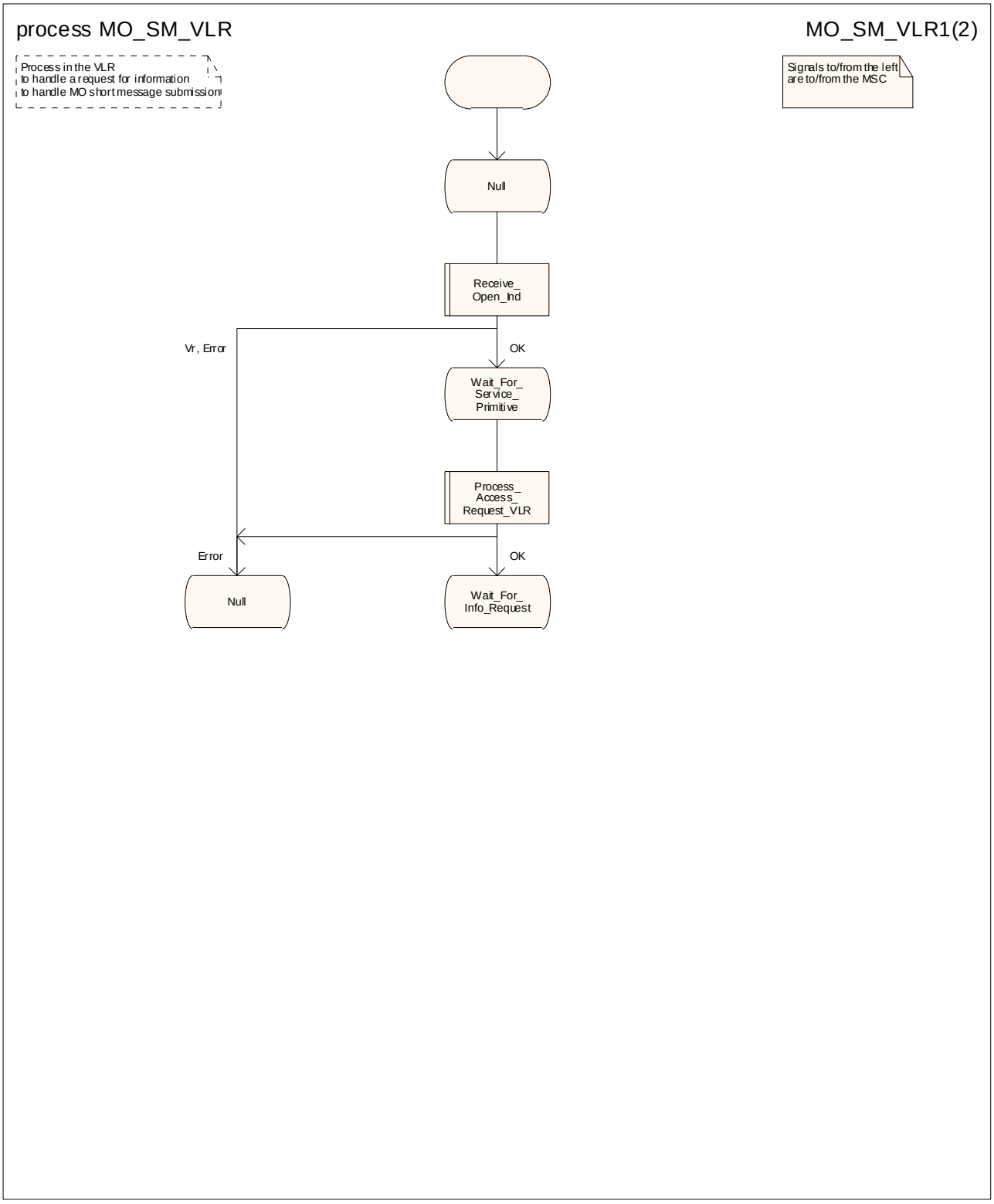


Figure 23.2/3(sheet 1 of 2): Process MO_SM_VLR

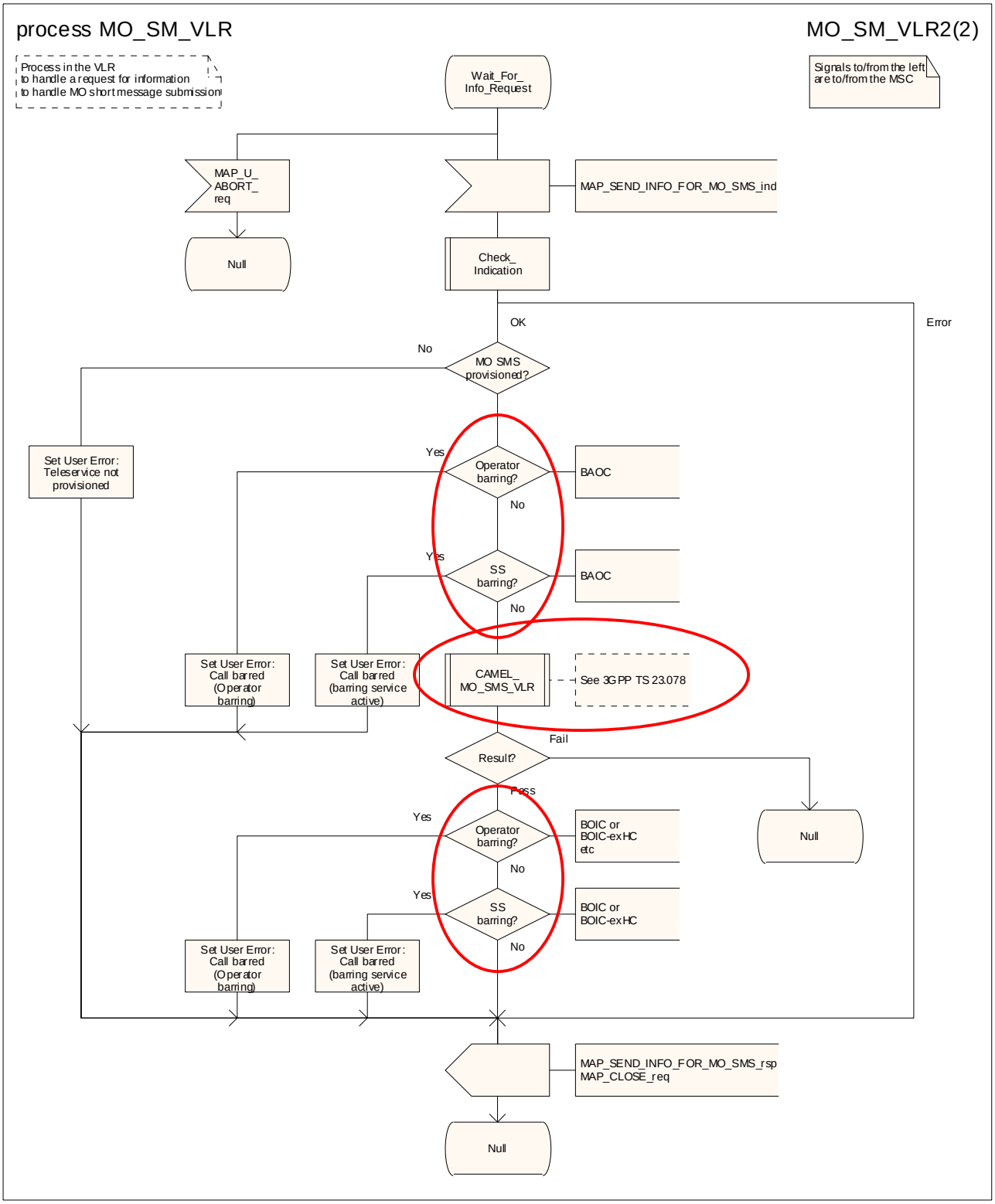


Figure 23.2/3(sheet 2 of 2): Process MO_SM_VLR

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

23.2.4 Procedure in the ~~servicing~~ SGSN

Any CAMEL-specific handling defined in this subclause is omitted if the SGSN does not support CAMEL control of MO SMS, or if the subscriber is not a CAMEL subscriber.

The process is triggered by a short message received from the MS over the Gb interface.

If the MO SMS service is not provisioned, the SGSN returns a Gb_RP_ERROR with error cause "Requested facility not subscribed", and the process returns to the Null state.

If the MO SMS service is provisioned, the SGSN checks whether Operator Determined Barring of all outgoing calls is in force.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN calls the procedure CAMEL_O_SMS_INIT and tests the result.

- if the result was "SMS_Aborted", the process returns to the Null state;
- if the result was "Release_SMS", the SGSN returns a Gb_RP_ERROR with an error cause as instructed by the gsmSCF to the MS, and the process returns to the Null state;
- if the result was "Redirect_SMS", the SGSN modifies the data for the submitted short message as instructed by the gsmSCF, and the MSC handling continues;
- if the result was "Continue", the SGSN handling continues.

The SGSN checks whether Operator Determined Barring of outgoing calls (other than barring of all outgoing calls) would prevent the submission of the short message.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;
  - if the dialogue opening is successful, the SGSN waits for the response from the SMS-IWMSC;
  - if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.
  - if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.
    - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;
    - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.
- if the two requests cannot be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

- if the dialogue opening is successful, the SGSN sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

- if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.

- if the SGSN receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the confirmation indicates that the submission of the short message failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state;

- if the dialogue with the SMS-IWMSC fails, the SGSN reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

~~When receiving the short message from the MS, the SGSN acts as follows:~~

- ~~if there is incompatibility in the subscription check, the RP_ERROR cause requested facility not subscribed is provided to the mobile station;~~

- ~~the SGSN opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS;~~

- ~~if the short message transfer would contravene operator determined barring, , the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the RP_ERROR cause operator determined barring is provided to the mobile station;~~

~~NOTE: The RP_ERROR causes are described in 3GPP TS 24.011 [37].~~

- ~~if no error is detected, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the SGSN will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation.~~

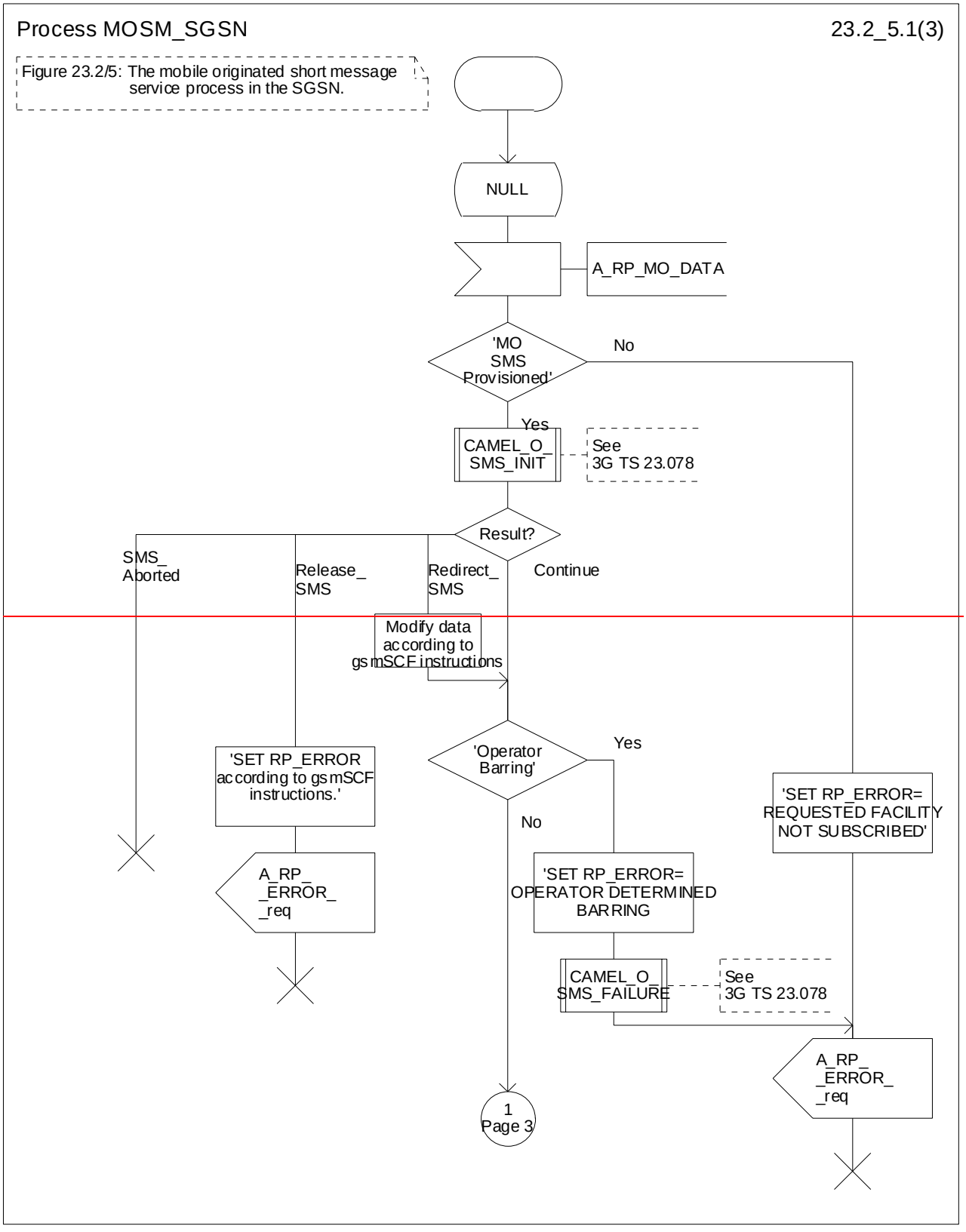
~~If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing SGSN will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

- ~~the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

- ~~one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

The mobile originated short message service proces~~sdure~~ in the SGSN is shown in figure 23.2/5.


Process MOSM_SGSN
23.2_5.1(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
NULL
A_RP_MO_DATA
'MO SMS Provisioned'
No
Yes
CAMEL_O_ SMS_INIT
See 3G TS 23.078
Result?
SMS_ Aborted
Release_ SMS
Redirect_ SMS
Continue
Modify data according to gsmSCF instructions
'Operator Barring'
Yes
No
'SET RP_ERROR according to gsmSCF instructions.'
A_RP_ _ERROR_ _req
'SET RP_ERROR= OPERATOR DETERMINED BARRING
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
'SET RP_ERROR= REQUESTED FACILITY NOT SUBSCRIBED'
A_RP_ _ERROR_ _req
1
Page 3

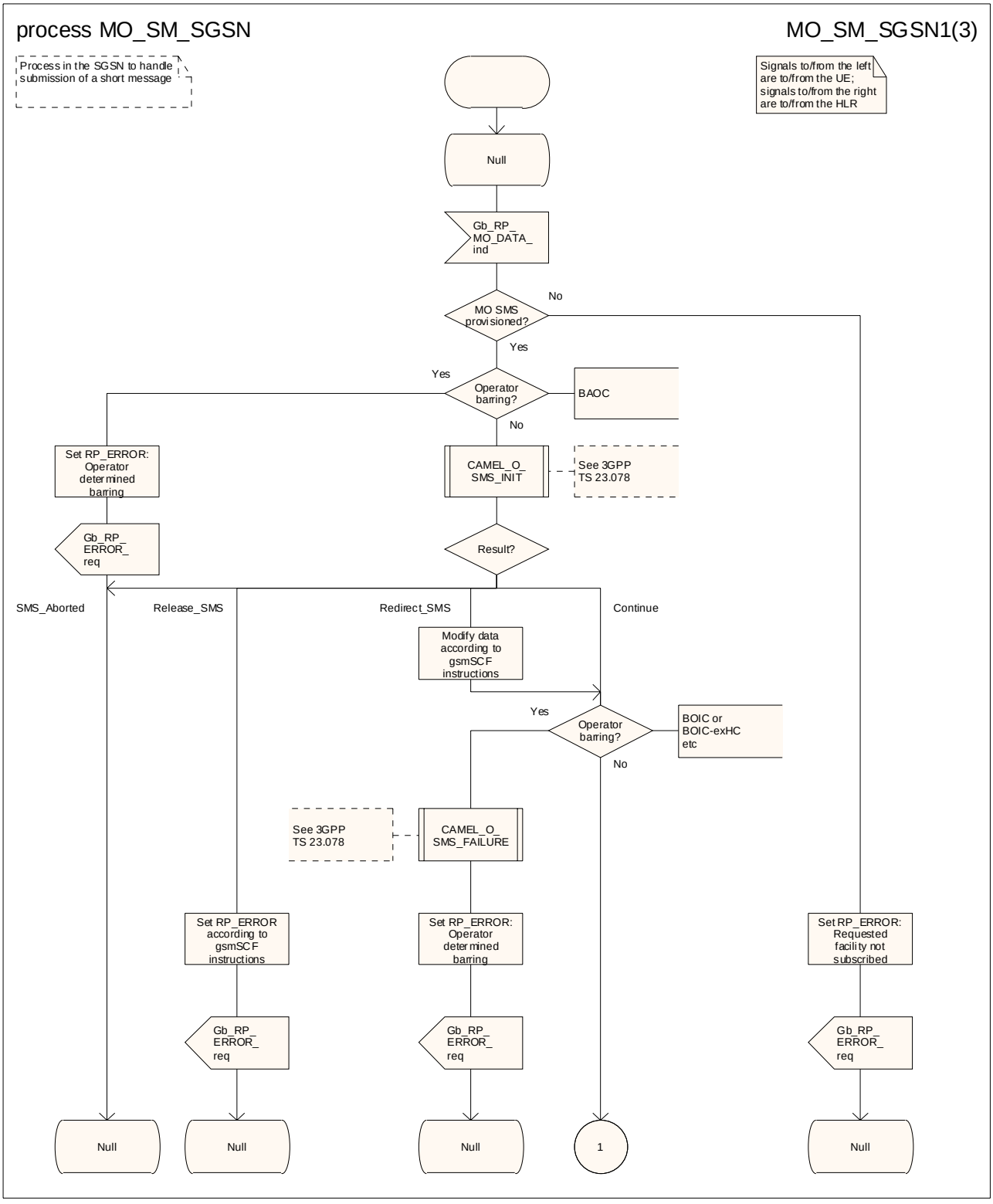
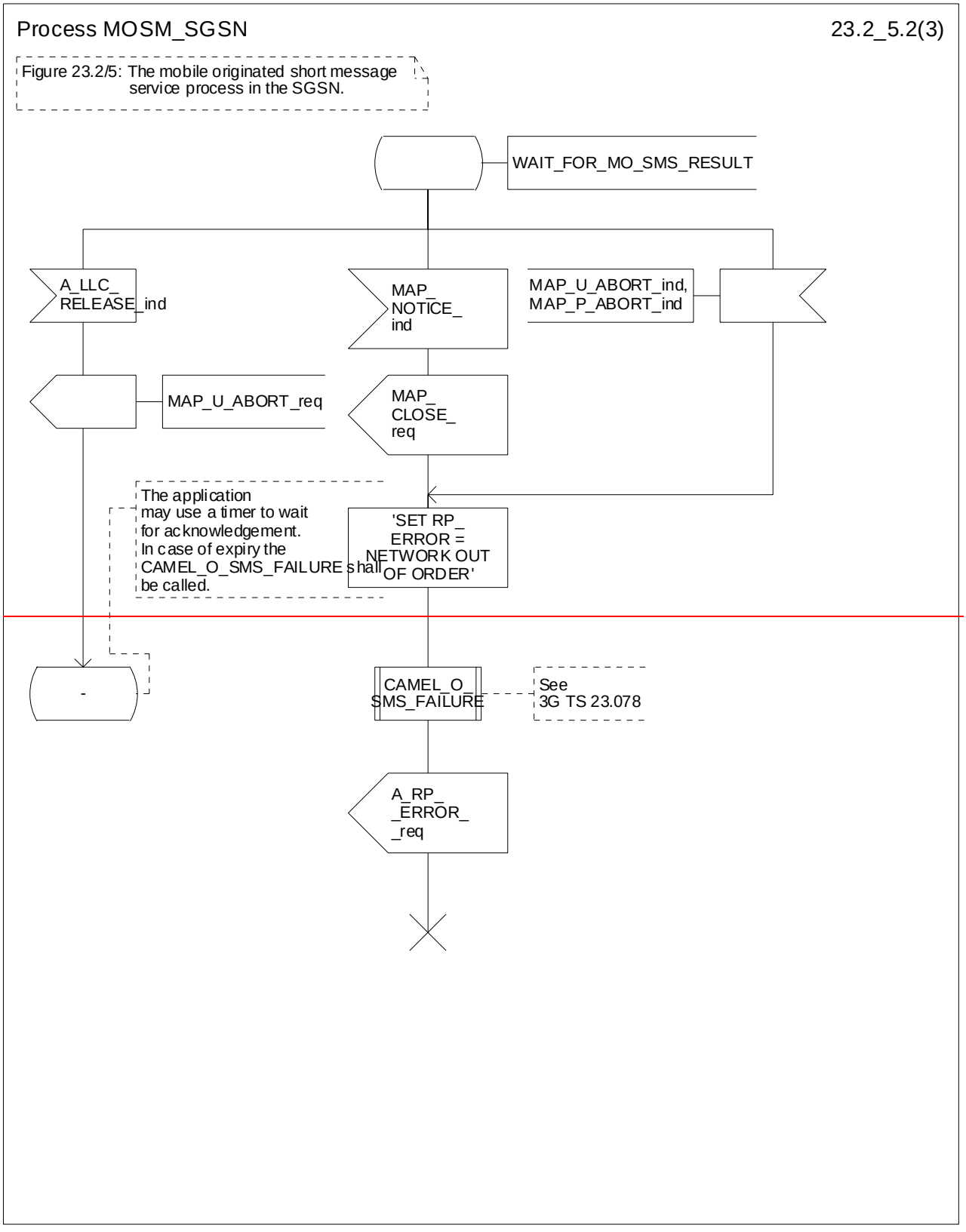


Figure 23.2/5 (sheet 1 of 3): Process MO_SM_SGSN

Process MOSM_SGSN 23.2_5.2(3)

Figure 23.2/5: The mobile originated short message service process in the SGSN.



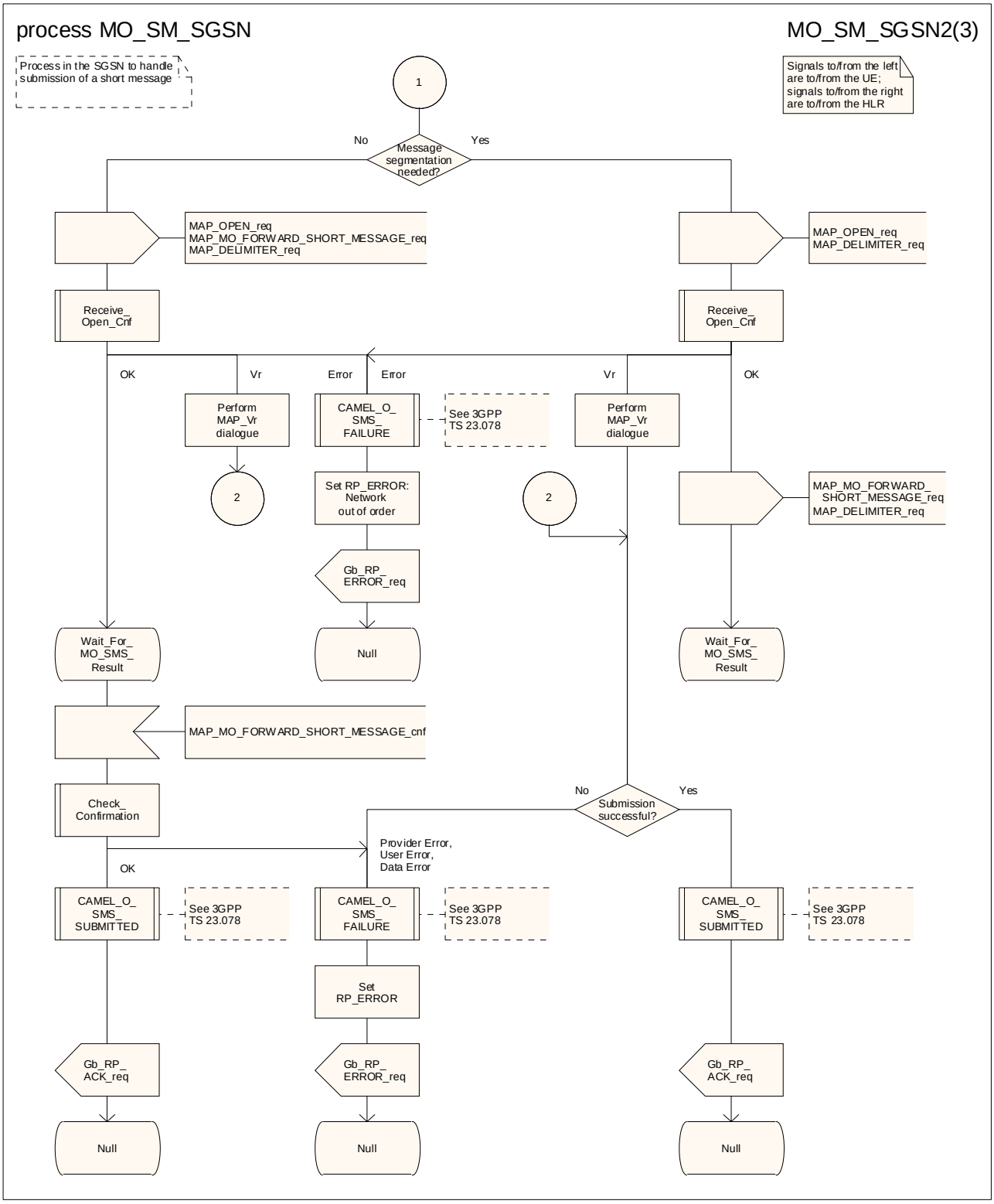
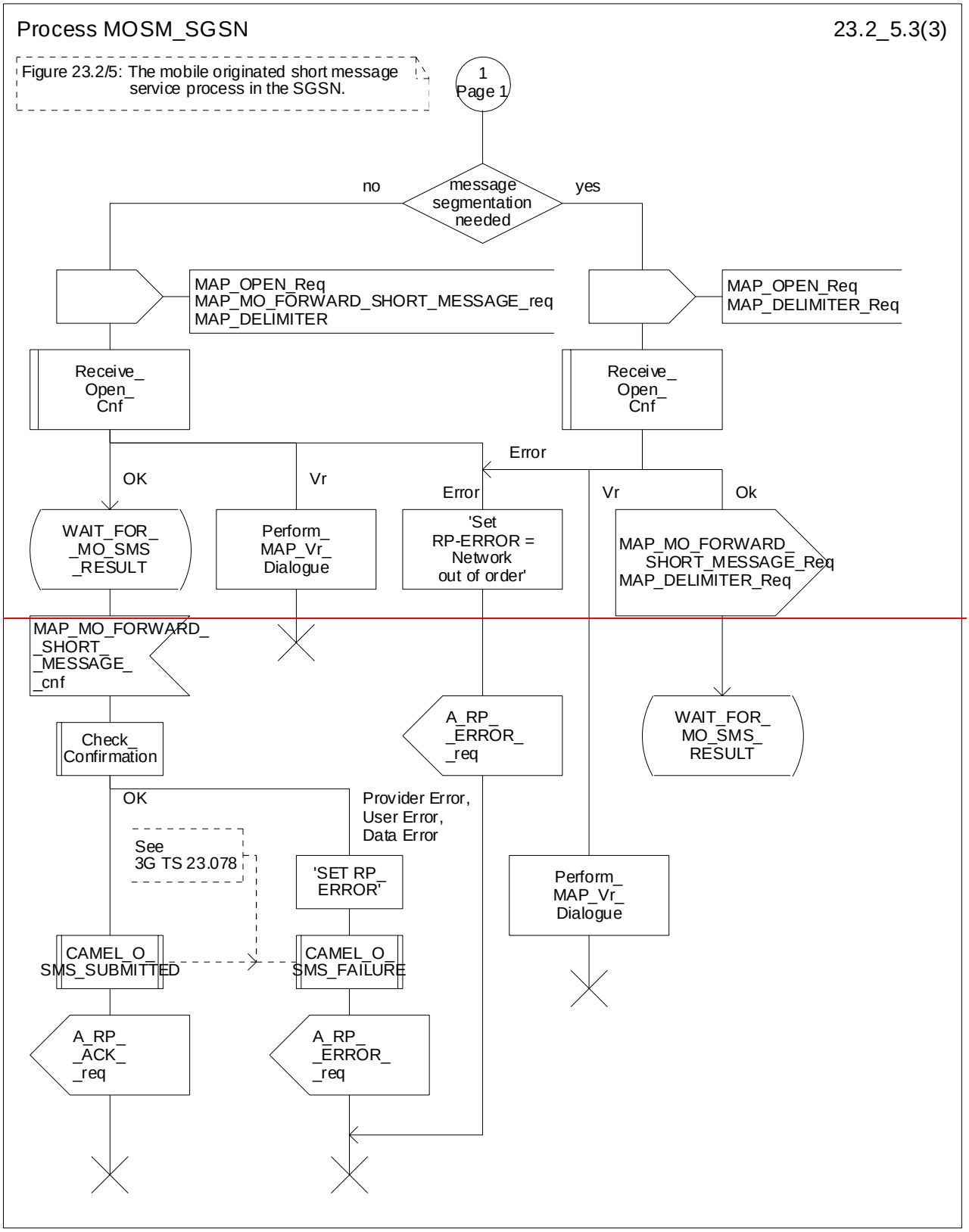


Figure 23.2/5 (sheet 2 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.3(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
1
Page 1
message segmentation needed
no
yes
MAP_OPEN_Req
MAP_MO_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
Vr
Error
Vr
Ok
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_Vr_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_MO_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_MO_FORWARD_ _SHORT_ _MESSAGE_ _cnf
A_RP_ _ERROR_ _req
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
OK
Provider Error, User Error, Data Error
See 3G TS 23.078
'SET RP_ ERROR'
Perform_ MAP_Vr_ Dialogue
CAMEL_O_ SMS_SUBMITTED
CAMEL_O_ SMS_FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req

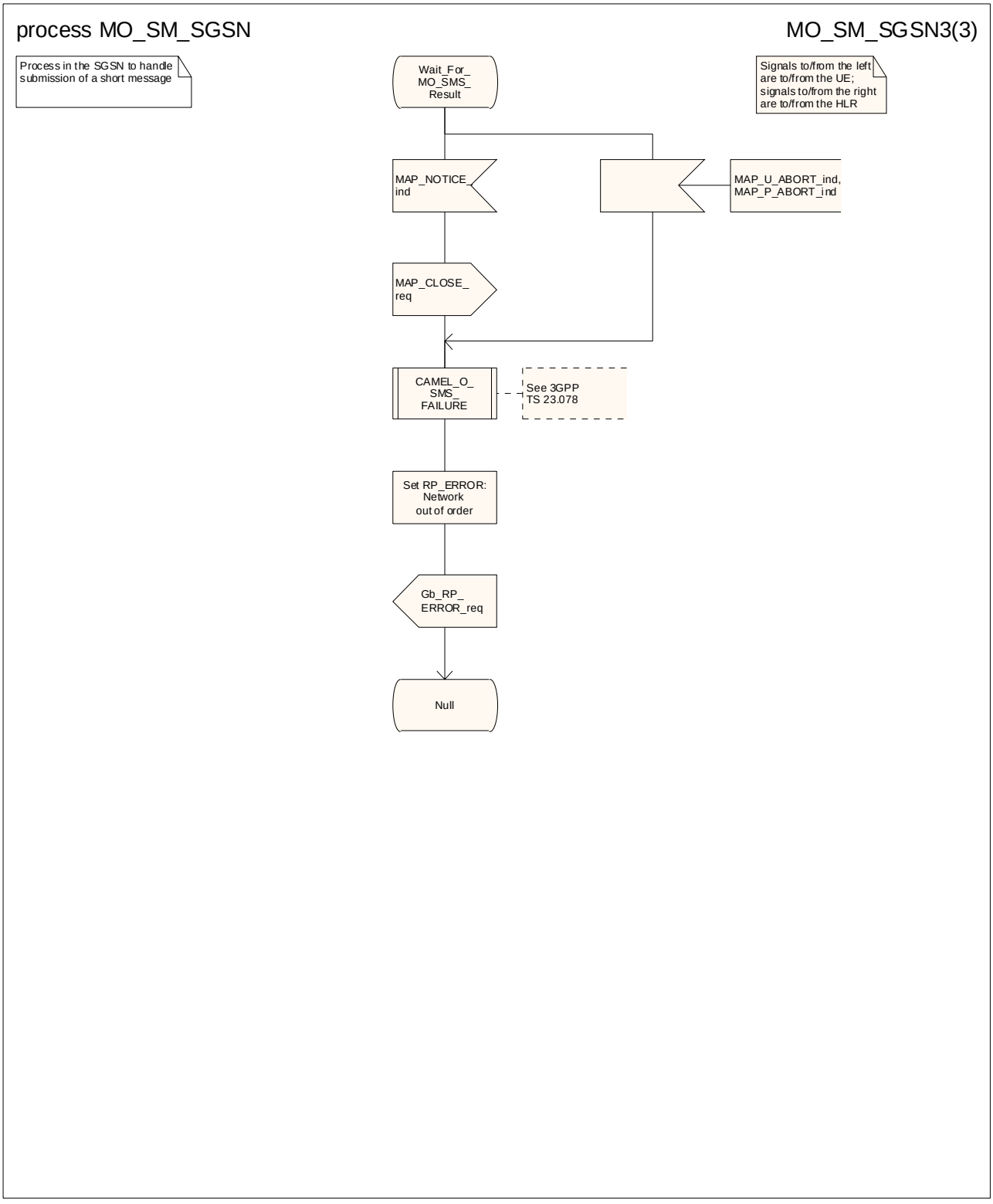


Figure 23.2/5 (sheet 3 of 3): Process MO_SM_SGSN

****** End of document ******

3GPP TSG CN Plenary Meeting #19
Birmingham, UK, 12th – 14th March 2003 **(Revision of N4-030259)**

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **544** ⌘ **rev** **2** ⌘ Current version: **5.4.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone, Lucent Technologies, L M Ericsson
Work item code:	⌘	CAMEL3
Date:	⌘	21/02/2003
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This requires changes to the processes MO_SMS_MSC and MO_SMS_VLR (text and SDL descriptions). Reflect the sequence of checking: BAOC (both ODB and SS in the MSC/VLR, ODB only in the SGSN); CAMEL handling; BOIC/BOIC-exHC (both ODB and SS in the MSC/VLR, ODB only in the SGSN), to reflect the description in 23.078.
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly, which can lead to complaints from subscribers about SMS submission not working when it should, or working (and being charged for) when it should not.

Clauses affected:	⌘	23.2.1, 23.2.2, 23.2.4

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		CR 23.078-529
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	The pretence of MAP dialogues between the MSC and the VLR leads to unnecessary complexity in the SDL diagrams (handling for MAP_NOTICE and MAP_P_ABORT, possibility of protocol version dropback). This has been removed, as a small step in the right direction. A text box has been added to each sheet of SDL which needs it, to state the convention for the source and destination of input and output signals. This has not been highlighted in the SDL diagrams.

**** First modified section ****

23.2.1 Procedure in the servicing MSC

Any CAMEL-specific handling defined in this subclause is omitted if the MSC does not support CAMEL control of MO SMS or if the subscriber does not have a subscription for CAMEL control of MO SMS.

~~The activation of the MAP_PROCESS_ACCESS_REQUEST service is described in the clause 25.4.1.~~

When the MSC receives~~ing~~ the short message from the A-interface, ~~the MSC~~it sends ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS request to the VLR~~. As~~ and waits for a response. While the MSC is waiting for a response from the VLR:

~~- if it receives a Release indication from the A-interface, it aborts the dialogue with the VLR, and the process terminates;~~

- if the VLR aborts, or prematurely closes, the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with error cause "Network out of order" to the MS, and the process terminates;

- if it receives a MAP_CONTINUE_CAMEL_SMS_HANDLING indication, it checks the indication.

  - if the indication is badly formed, the MSC sends an A_RP_ERROR with error cause "Network out of order" to the MS and aborts the dialogue with the VLR, and the process terminates;

  - if the indication is OK, the MSC calls the procedure CAMEL_O_SMS_INIT and tests the result.

    - if the result was "SMS_Aborted", the MSC aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Release_SMS", the MSC returns an A_RP_ERROR with an error cause as instructed by the gsmSCF to the MS and aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Redirect SMS", the MSC modifies the data for the submitted short message as instructed by the gsmSCF, sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress O-CSI set~~ and waits for a response;

    - if the result was "Continue", the MSC sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress O-CSI set~~ and waits for a response. The handling for this request is shown in the procedure CAMEL_MO_SMS_VLR (see 3GPP TS 23.078 [98]).

- if it ~~will~~ receives ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS confirmation from VLR, it checks the confirmation. ~~indicating that:~~

  - if the confirmation includes an error, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

  - if the confirmation indicates a successful result, the MSC checks whether the MSC is also the SMS-IWMSC.

    - if the MSC is separate from the SMS-IWMSC, MSC handling continues as described below under the heading "Serving MSC is separate from SMS-IWMSC".

    - if the MSC is also the SMS-IWMSC, the MSC handling continues as described below under the heading "Serving MSC is SMS-IWMSC";

Serving MSC is separate from SMS-IWMSC

The MSC checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;

  - if the dialogue opening is successful, the MSC waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the two requests cannot be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

- if the dialogue opening is successful, the MSC sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol, and checks the result.

  - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the MSC receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the confirmation indicates that the submission of the short message failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

~~- if the MSC receives a Release indication from the A-interface, it aborts the dialogue with the SMS-IWMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the dialogue with the SMS-IWMSC fails, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates.

Serving MSC is SMS-IWMSC

The MSC sends an SC_RP_MO_DATA request to the Short Message Service Centre (SMSC), and waits for the response.

~~- if the MSC receives a Release indication from the A-interface, it aborts the dialogue with the SMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the MSC receives an error response from the SMSC, it reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

- if the SMSC aborts the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the MSC receives a positive response from the SMSC, it reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates.

~~- the service ends successfully. If the MSC is not itself the IWMSC, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request;~~

~~- the service ends unsuccessfully. The error cause in the MAP_SEND_INFO_FOR_MO_SMS confirmation indicates the reason for the unsuccessful end. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26].~~

~~If there are data errors in the MAP_SEND_INFO_FOR_MO_SMS confirmation, or there is an operation failure in MAP, the RP_ERROR cause network out of order is forwarded to the mobile station.~~

~~The MSC opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS.~~

~~The MSC checks the barring as follows;~~

~~- if the short message transfer would contravene operator determined barring, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause operator barring is returned to MS;~~

~~- if the short message transfer would contravene the supplementary service call barring conditions, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause barring service active is returned to MS.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the MSC will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation. If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing MSC will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

~~- the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

~~- one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in the SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

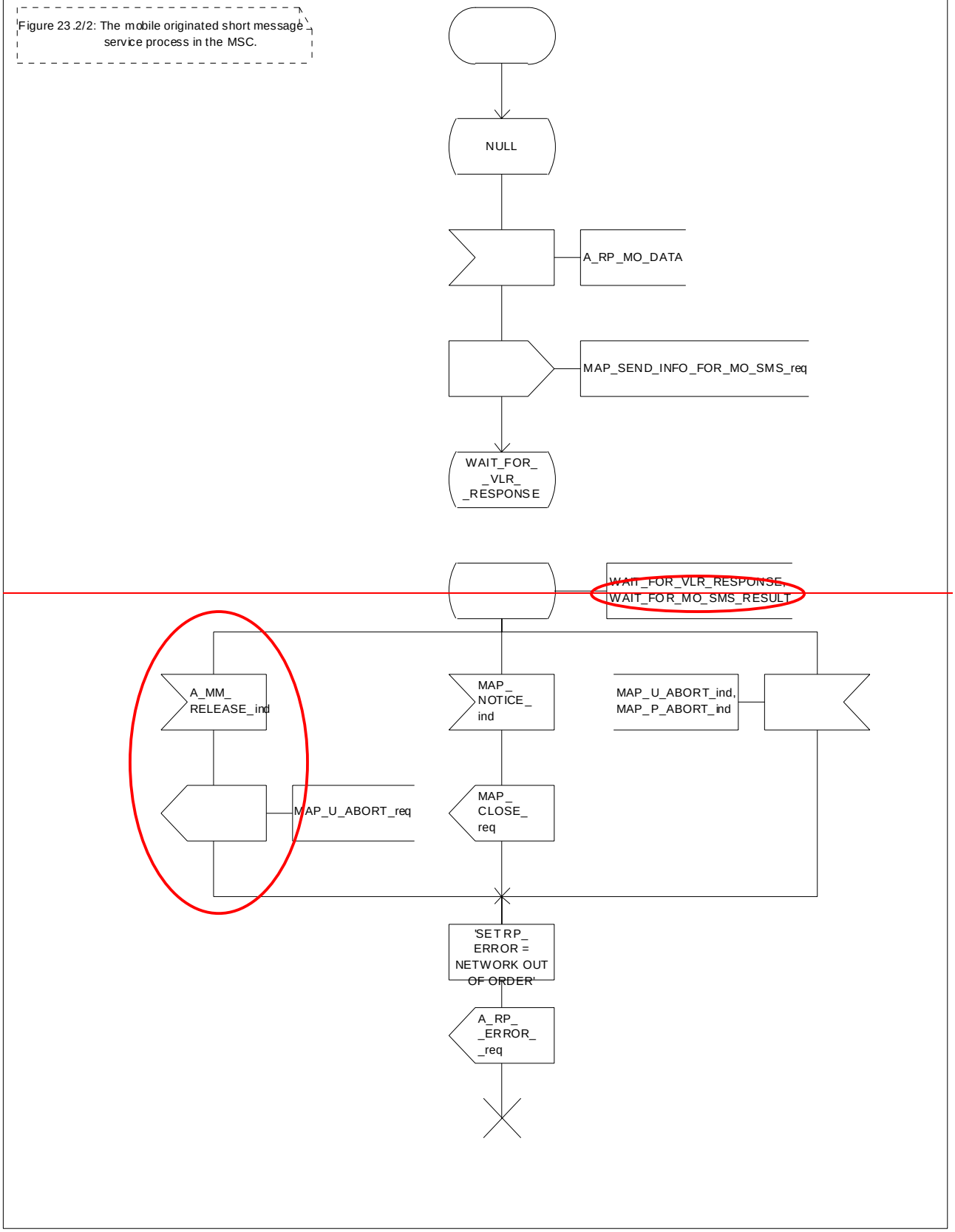
~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

~~If the MSC itself is the interworking MSC, the short message is forwarded to the Service Centre. In that case the service MAP_MO_FORWARD_SHORT_MESSAGE is not initiated. The acknowledgement message from the Service Centre is forwarded to the mobile station (3GPP TS 23.040[26], 3GPP TS 24.011 [37]).~~

The mobile originated short message service proces~~sdure~~ in the MSC is shown in figure 23.2/2.

Process MOSM_MSC 23.2_2.1(3)

Figure 23.2/2: The mobile originated short message service process in the MSC.



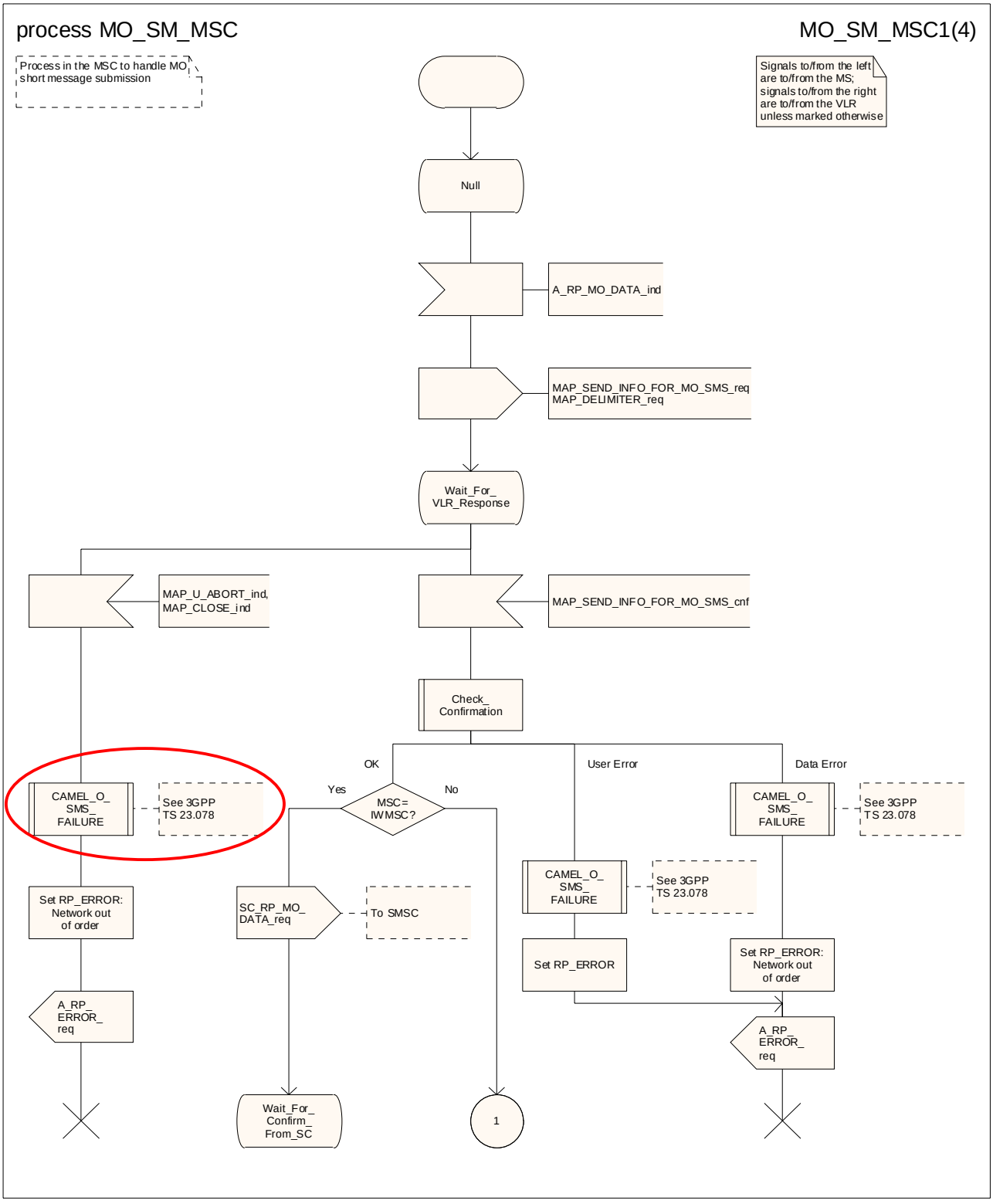
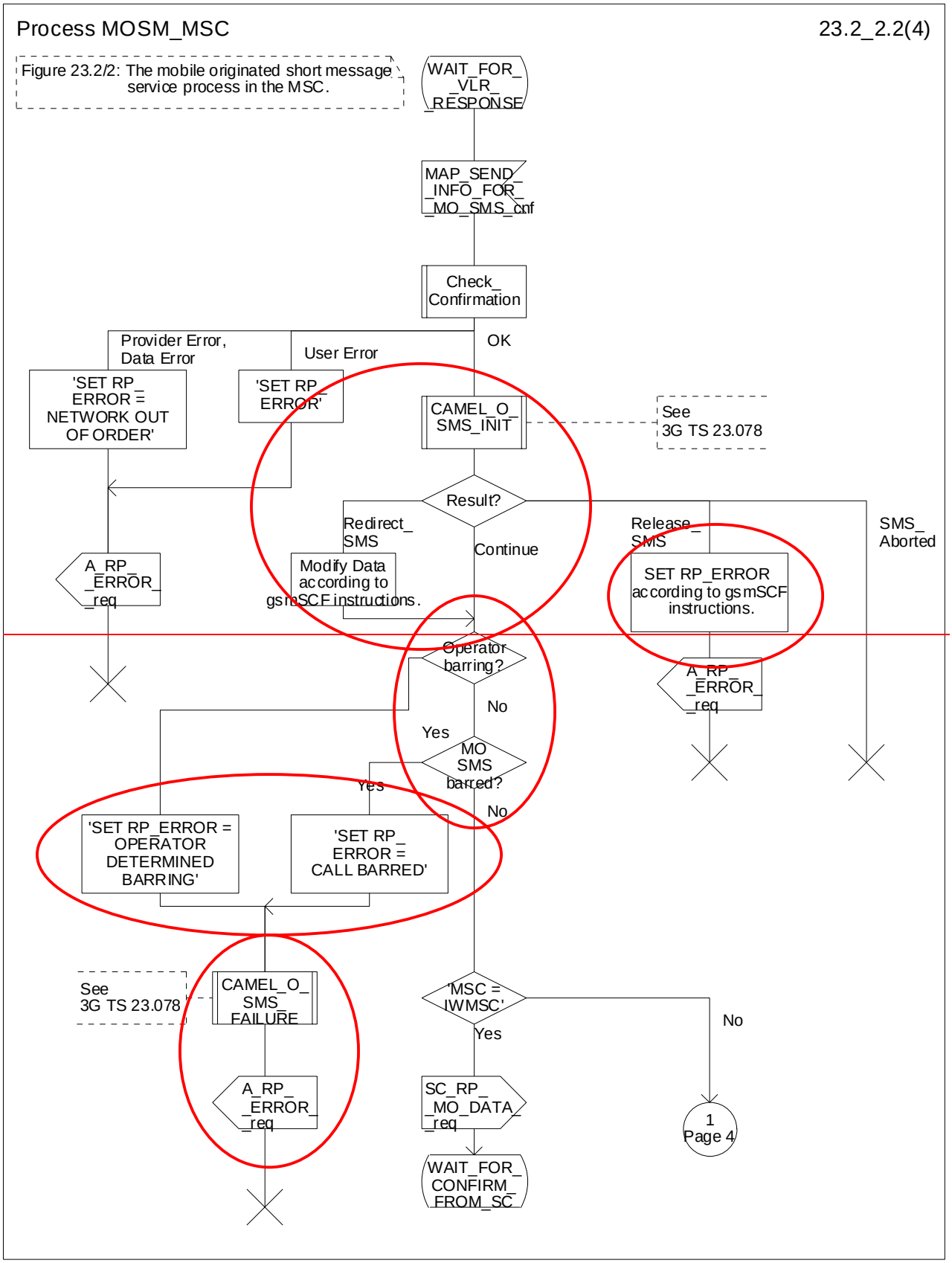


Figure 23.2/2 (sheet 1 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.2(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
WAIT_FOR_VLR_RESPONSE
MAP_SEND_INFO_FOR_MO_SMS_cnf
Check_Confirmation
Provider Error, Data Error
User Error
OK
'SET RP_ERROR = NETWORK OUT OF ORDER'
'SET RP_ERROR'
CAMEL_O_SMS_INIT
See 3G TS 23.078
Result?
Redirect_SMS
Continue
Release_SMS
SMS_Aborted
A_RP_ERROR_req
Modify Data according to gsmSCF instructions.
SET RP_ERROR according to gsmSCF instructions.
Operator barring?
No
Yes
MO SMS barred?
Yes
No
'SET RP_ERROR = OPERATOR DETERMINED BARRING'
'SET RP_ERROR = CALL BARRED'
See 3G TS 23.078
CAMEL_O_SMS_FAILURE
'MSC = IWMSC'
No
Yes
A_RP_ERROR_req
SC_RP_MO_DATA_req
1 Page 4
WAIT_FOR_CONFIRM_FROM_SC

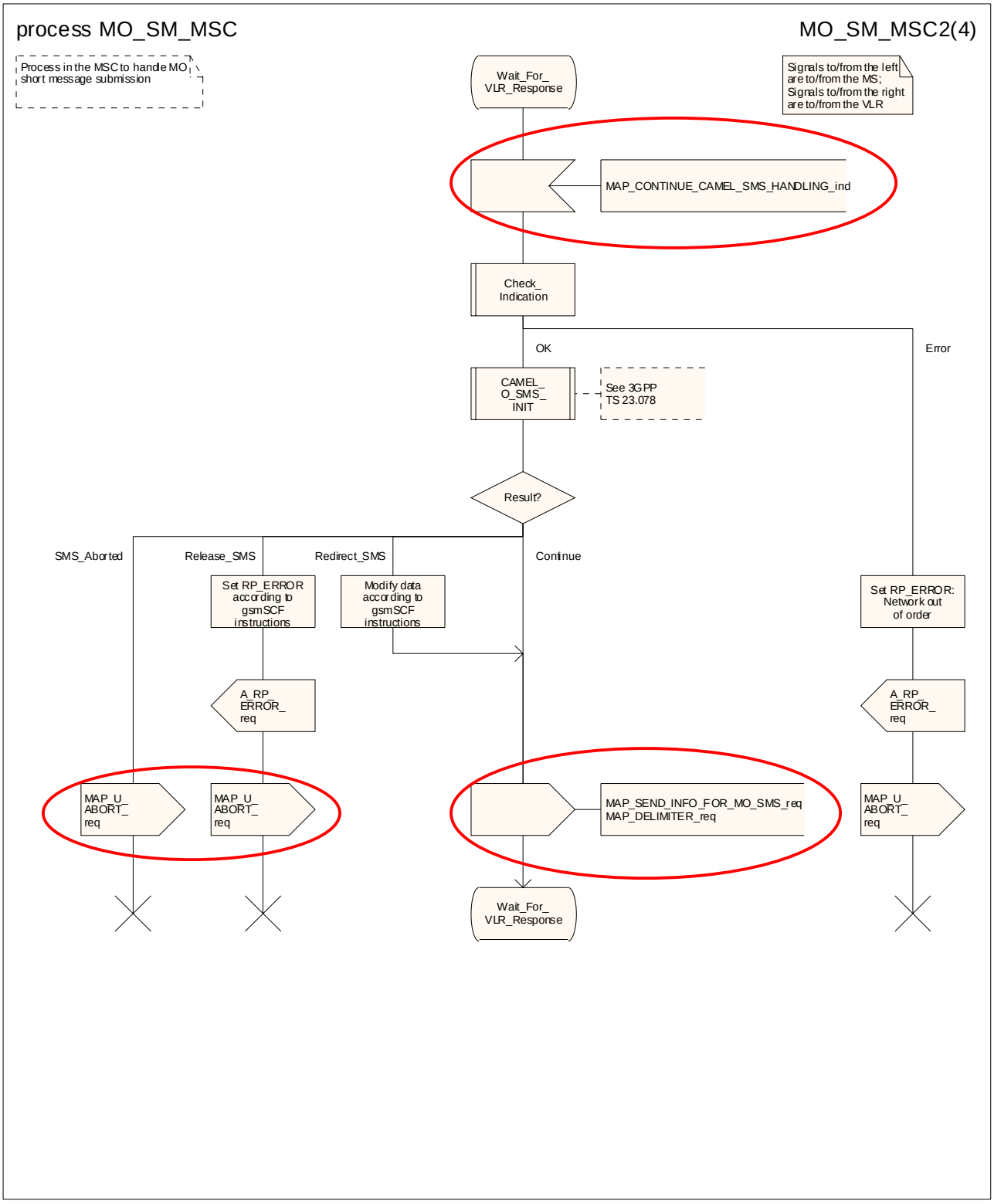
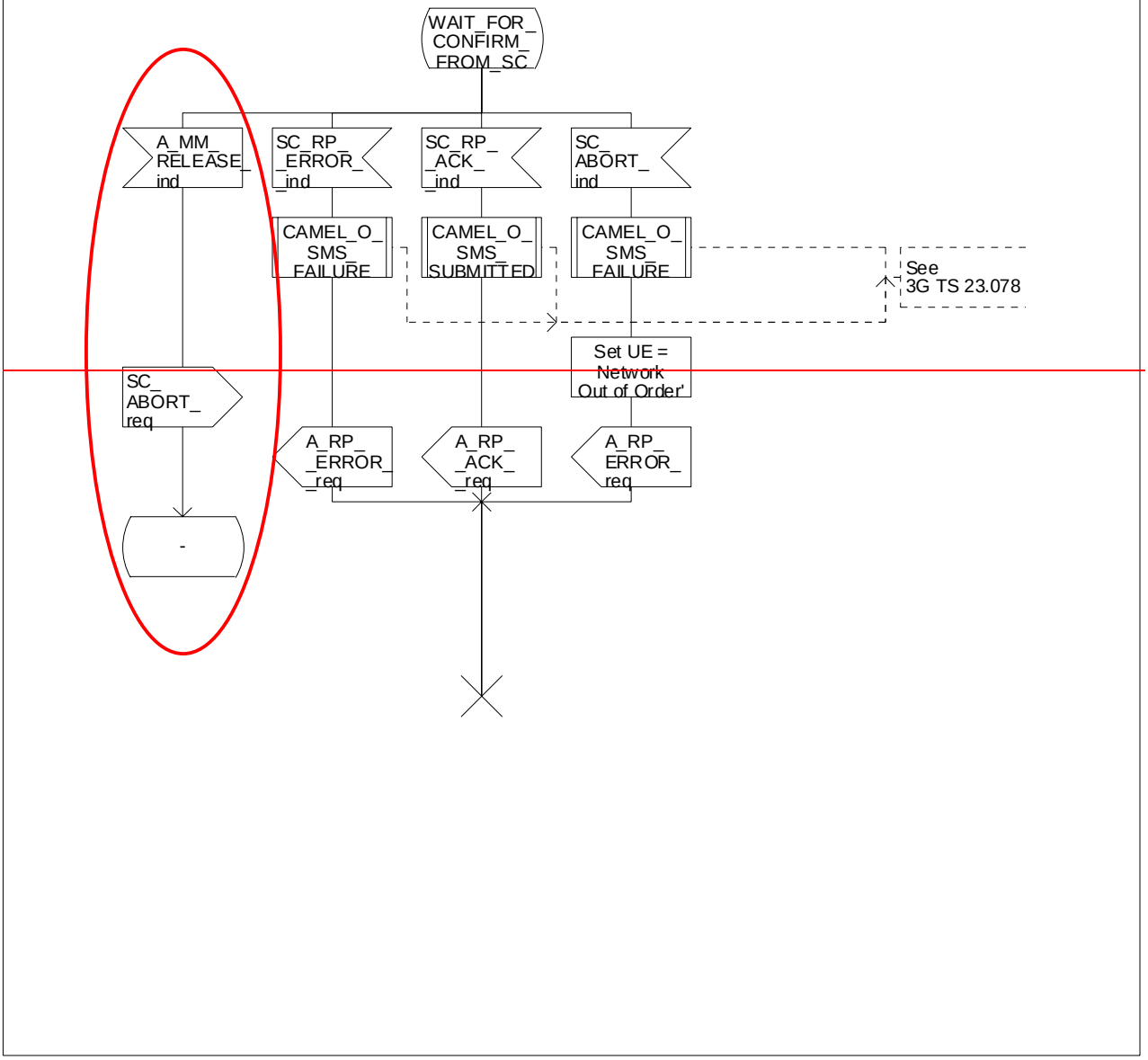


Figure 23.2/2 (sheet 2 of 4): Process MO_SM_MSC

Process MOSM_MSC 23.2_2.new3(4)

Figure 23.2/2: The mobile originated short message service process in the MSC.



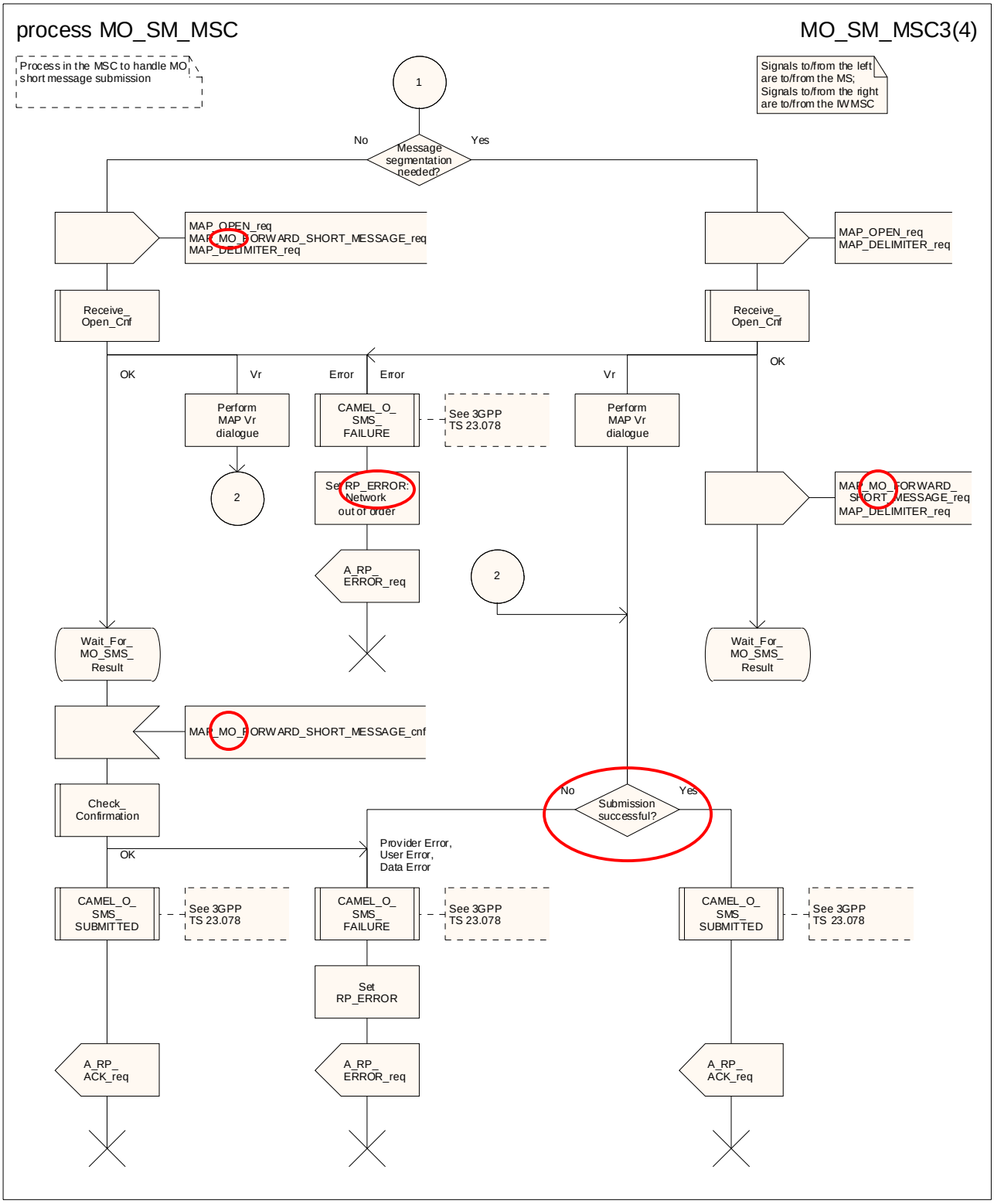
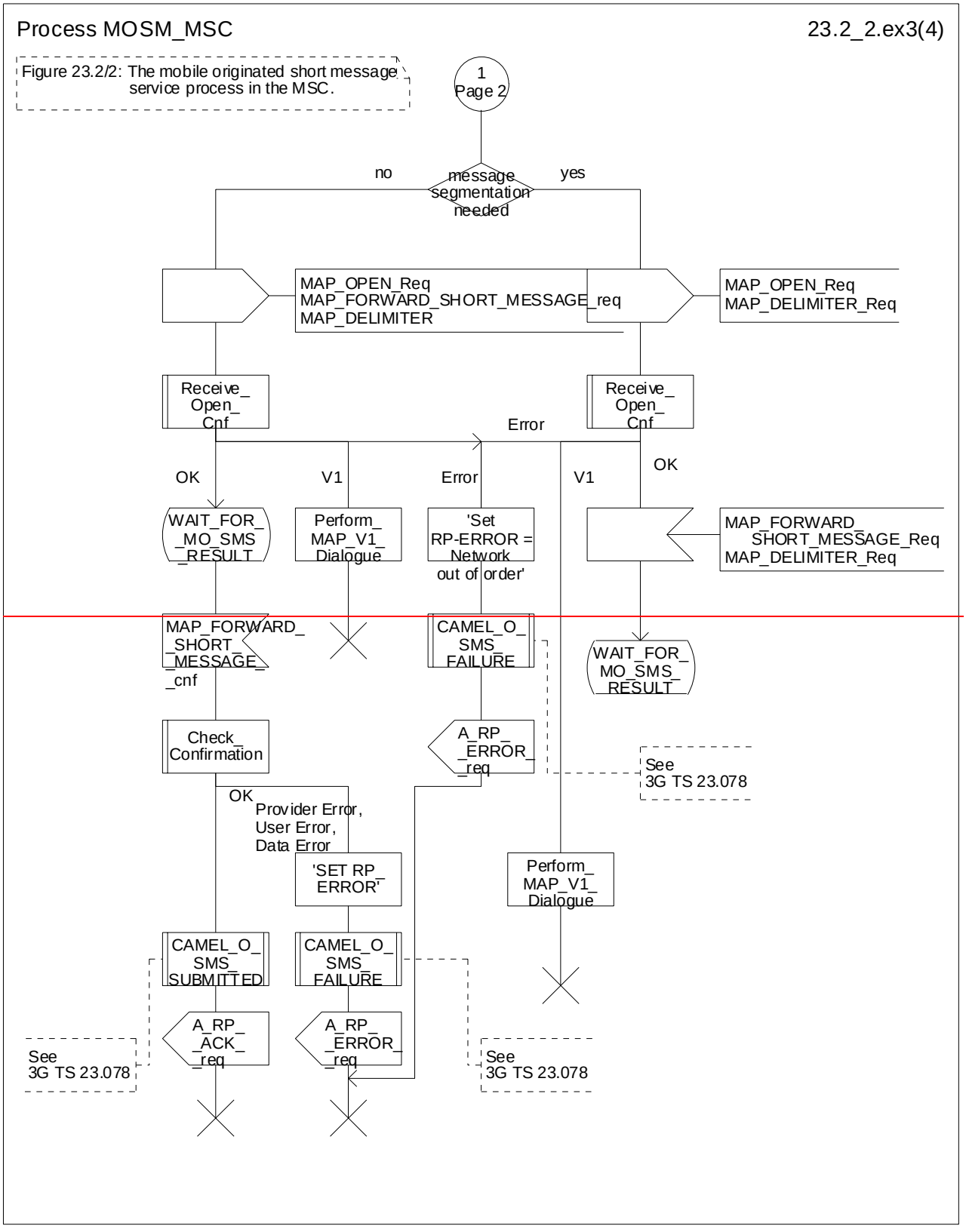


Figure 23.2/2 (sheet 3 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.ex3(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
1
Page 2
no
message segmentation needed
yes
MAP_OPEN_Req
MAP_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
V1
Error
V1
OK
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_V1_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_FORWARD_ _SHORT_ _MESSAGE_ _cnf
CAMEL_O_ SMS_ FAILURE
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
A_RP_ _ERROR_ _req
See 3G TS 23.078
OK
Provider Error, User Error, Data Error
'SET RP_ ERROR'
Perform_ MAP_V1_ Dialogue
CAMEL_O_ SMS_ SUBMITTED
CAMEL_O_ SMS_ FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req
See 3G TS 23.078
See 3G TS 23.078

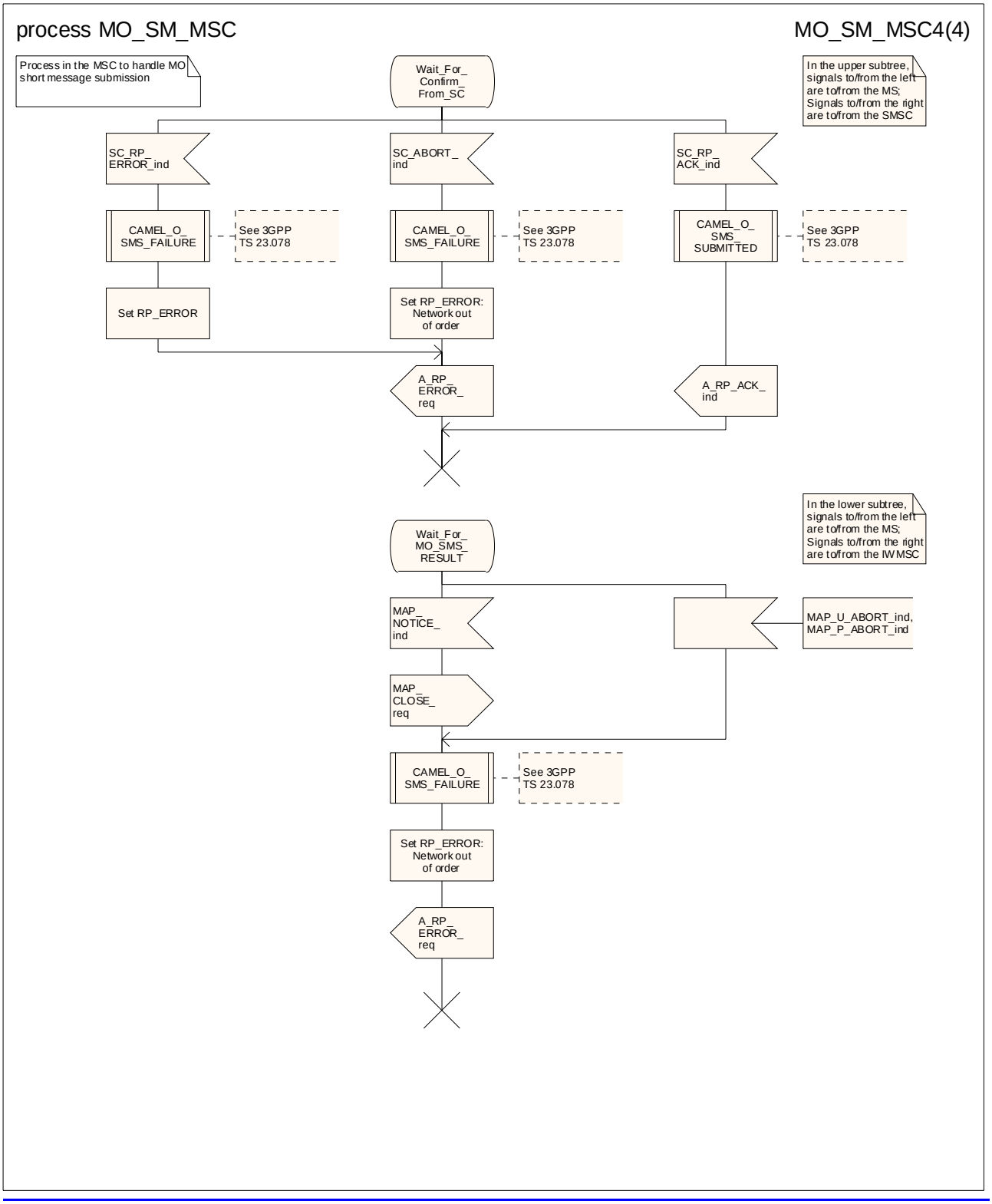


Figure 23.2/2 (sheet 4 of 4): Process MO_SM_MSC

23.2.2 Procedure in the VLR

Any CAMEL-specific handling defined in this subclause is omitted if the VLR does not support CAMEL control of MO SMS.

The process is triggered by a dialogue opening request followed by a MAP_PROCESS_ACCESS_REQUEST including a CM service type Short Message Service.

If the macro Process_Access_Request_VLR takes the "OK" exit, the VLR waits for a MAP_SEND_INFO_FOR_MO_SMS indication from the MSC.

- If the MSC aborts the dialogue, the process returns to the Null state;
- if the indication is badly formed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the appropriate user error;
- if the indication is OK, the VLR checks whether the submission of the short message is allowed
  - if MO SMS is not provisioned, VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Teleservice not provisioned";
  - if the submission of the short message is prevented by Operator Determined Barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by supplementary service barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - the VLR calls the procedure CAMEL_MO_SMS_VLR and checks the result.
    - if the result is "Fail", the process returns to the Null state;
    - if the result is "Pass", the VLR continues to check the subscription information.
  - if the submission of the short message is prevented by Operator Determined Barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by ~~the Barring~~ supplementary service barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - if the submission of the short message is allowed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the MSISDN of the requesting subscriber..

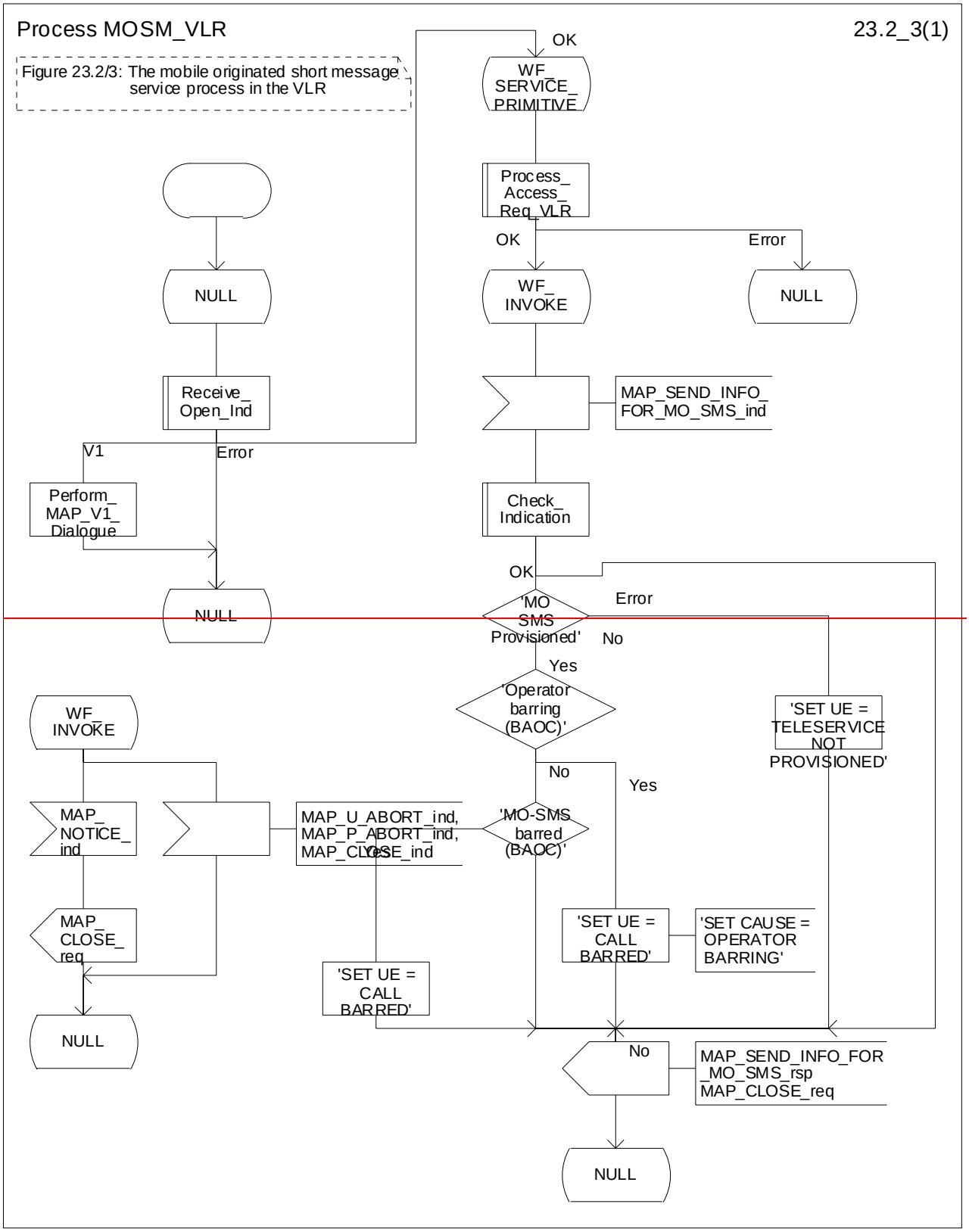
When the VLR has returned the MAP_SEND_INFO_FOR_MO_SMS response, the process returns to the Null state.

~~The MAP_PROCESS_ACCESS_REQUEST indication starts the MAP_PROCESS_ACCESS_REQUEST service in the VLR. The application context in the MAP_OPEN indication is mobile originated short message transfer.~~

~~If the service MAP_PROCESS_ACCESS_REQUEST is successful, the VLR waits for the next message from the MSC. When receiving the MAP_SEND_INFO_FOR_MO_SMS indication, the VLR acts as follows:~~

- ~~if there is incompatibility in the subscription check, the error teleservice not provisioned is returned to the MSC;~~
- ~~if the short message transfer would contravene Operator determined Barring (BAOC), the call barred error with cause operator barring is returned;~~
- ~~if the short message transfer would contravene the supplementary service call barring conditions (BAOC)in the VLR, the call barred error with cause barring service active is returned.~~

~~When the mobile subscriber has passed all checks, the MAP_SEND_INFO_FOR_MO_SMS response is initiated and the procedure is terminated in the VLR.~~ The mobile originated short message transfer process~~dure~~ in the VLR is shown in figure 23.2/3.


Process MOSM_VLR
23.2_3(1)
Figure 23.2/3: The mobile originated short message service process in the VLR
OK
WF_ SERVICE_ PRIMITIVE
Process_ Access_ Req_VLR
OK
Error
NULL
WF_ INVOKE
NULL
Receive_ Open_Ind
MAP_SEND_INFO_ FOR_MO_SMS_ind
V1
Error
Perform_ MAP_V1_ Dialogue
Check_ Indication
OK
NULL
'MO SMS Provisioned'
Error
No
Yes
'Operator barring (BAOC)'
WF_ INVOKE
'SET UE = TELESERVICE NOT PROVISIONED'
No
Yes
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind, MAP_CLOSE_ind
'MO-SMS barred (BAOC)'
MAP_ CLOSE_ req
'SET UE = CALL BARRED'
'SET UE = CALL BARRED'
'SET CAUSE = OPERATOR BARRING'
NULL
No
MAP_SEND_INFO_FOR _MO_SMS_rsp
MAP_CLOSE_req
NULL

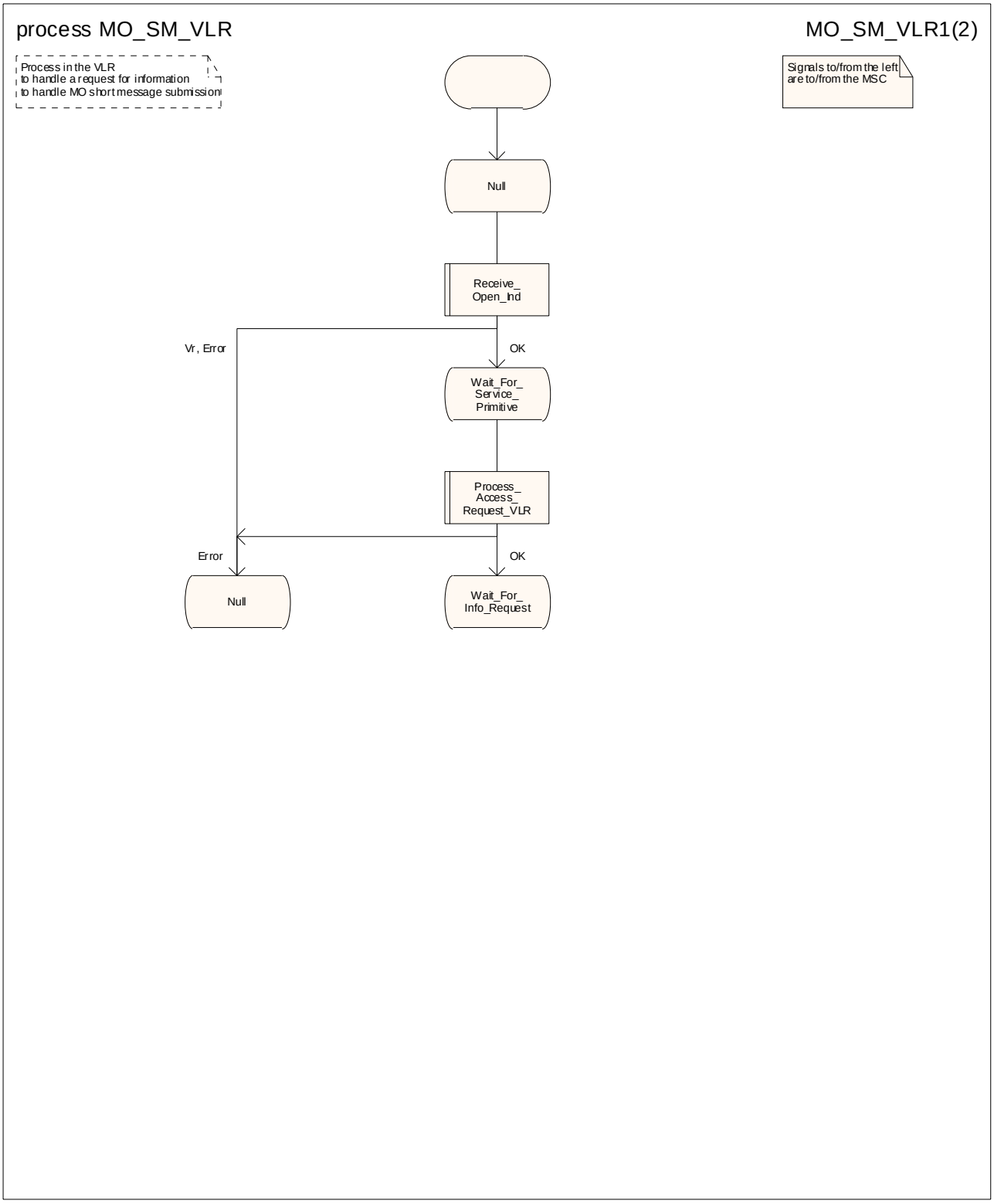


Figure 23.2/3(sheet 1 of 2): Process MO_SM_VLR

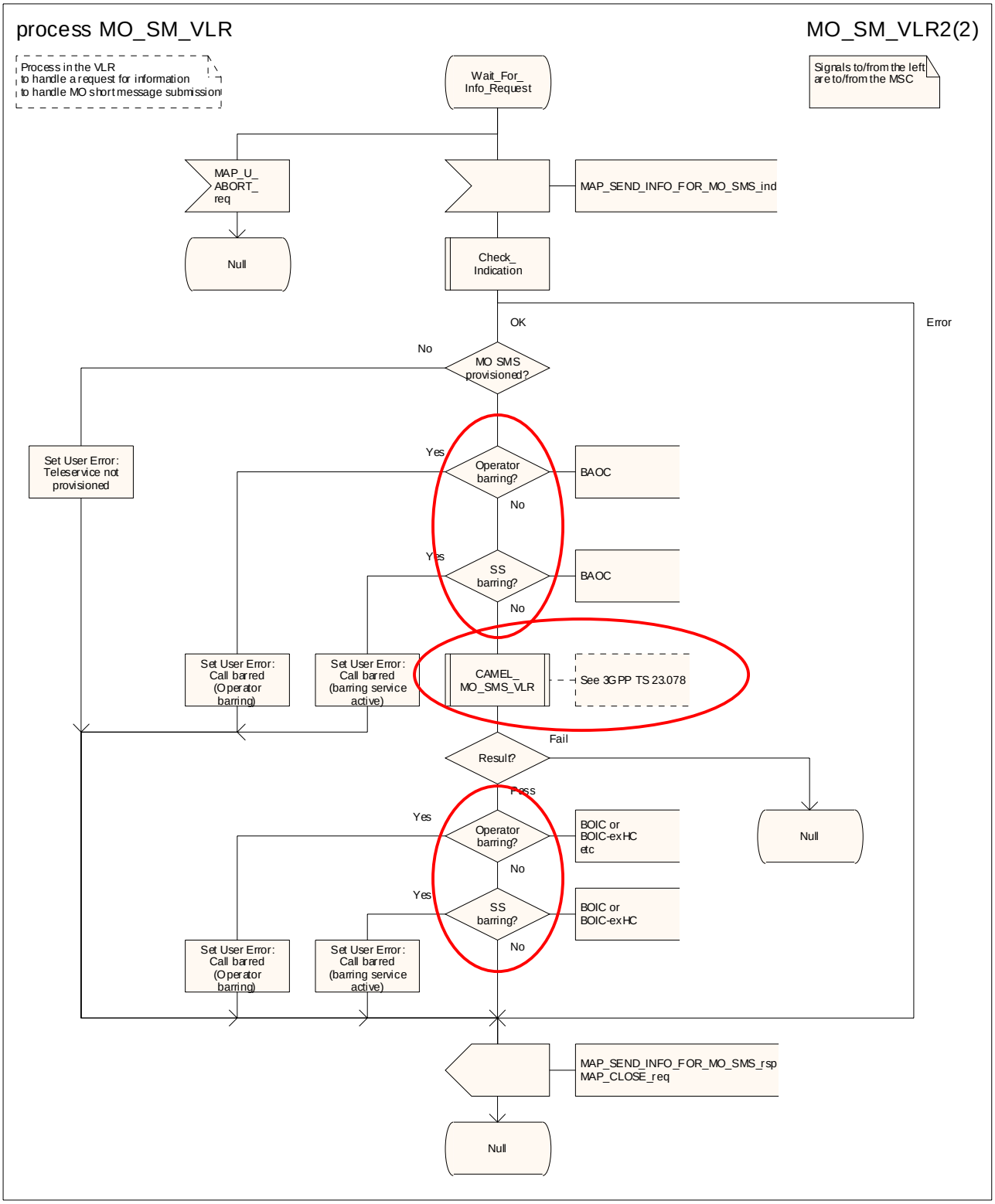


Figure 23.2/3(sheet 2 of 2): Process MO_SM_VLR

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

23.2.4 Procedure in the ~~servicing~~ SGSN

Any CAMEL-specific handling defined in this subclause is omitted if the SGSN does not support CAMEL control of MO SMS, or if the subscriber is not a CAMEL subscriber.

The process is triggered by a short message received from the MS over the Gb interface.

If the MO SMS service is not provisioned, the SGSN returns a Gb_RP_ERROR with error cause "Requested facility not subscribed", and the process returns to the Null state.

If the MO SMS service is provisioned, the SGSN checks whether Operator Determined Barring of all outgoing calls is in force.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN calls the procedure CAMEL_O_SMS_INIT and tests the result.

- if the result was "SMS_Aborted", the process returns to the Null state;
- if the result was "Release_SMS", the SGSN returns a Gb_RP_ERROR with an error cause as instructed by the gsmSCF to the MS, and the process returns to the Null state;
- if the result was "Redirect_SMS", the SGSN modifies the data for the submitted short message as instructed by the gsmSCF, and the MSC handling continues;
- if the result was "Continue", the SGSN handling continues.

The SGSN checks whether Operator Determined Barring of outgoing calls (other than barring of all outgoing calls) would prevent the submission of the short message.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;
  - if the dialogue opening is successful, the SGSN waits for the response from the SMS-IWMSC;
  - if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.
  - if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.
    - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;
    - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.
- if the two requests cannot be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

- if the dialogue opening is successful, the SGSN sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

- if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.

- if the SGSN receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the confirmation indicates that the submission of the short message failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state;

- if the dialogue with the SMS-IWMSC fails, the SGSN reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

~~When receiving the short message from the MS, the SGSN acts as follows:~~

- ~~if there is incompatibility in the subscription check, the RP_ERROR cause requested facility not subscribed is provided to the mobile station;~~

- ~~the SGSN opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS;~~

- ~~if the short message transfer would contravene operator determined barring, , the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the RP_ERROR cause operator determined barring is provided to the mobile station;~~

~~NOTE: The RP_ERROR causes are described in 3GPP TS 24.011 [37].~~

- ~~if no error is detected, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the SGSN will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation.~~

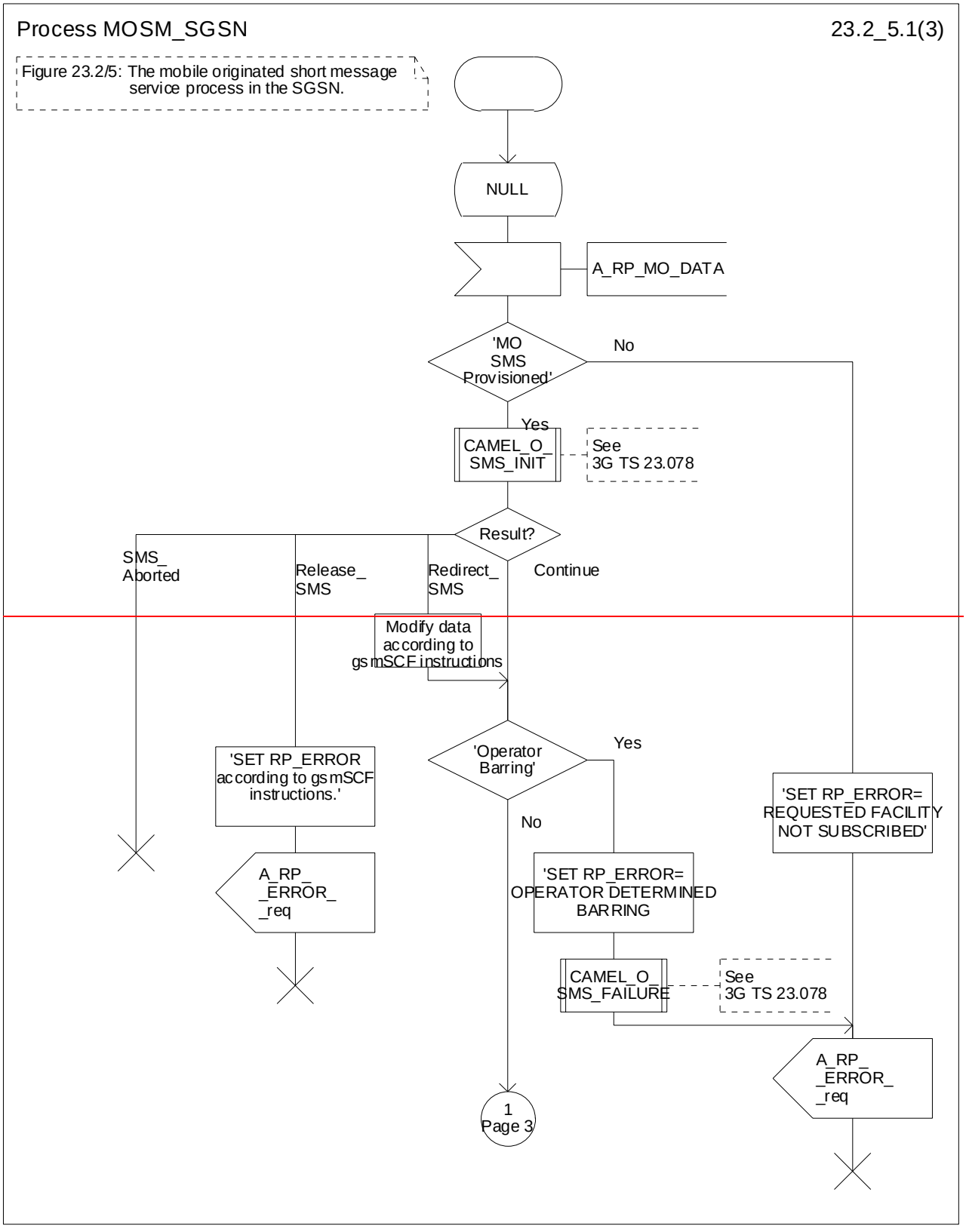
~~If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing SGSN will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

- ~~the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

- ~~one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

The mobile originated short message service proces~~sdure~~ in the SGSN is shown in figure 23.2/5.


Process MOSM_SGSN
23.2_5.1(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
NULL
A_RP_MO_DATA
'MO SMS Provisioned'
No
Yes
CAMEL_O_ SMS_INIT
See 3G TS 23.078
Result?
SMS_ Aborted
Release_ SMS
Redirect_ SMS
Continue
Modify data according to gsmSCF instructions
'Operator Barring'
Yes
No
'SET RP_ERROR according to gsmSCF instructions.'
'SET RP_ERROR= REQUESTED FACILITY NOT SUBSCRIBED'
A_RP_ _ERROR_ _req
'SET RP_ERROR= OPERATOR DETERMINED BARRING
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
A_RP_ _ERROR_ _req
1 Page 3

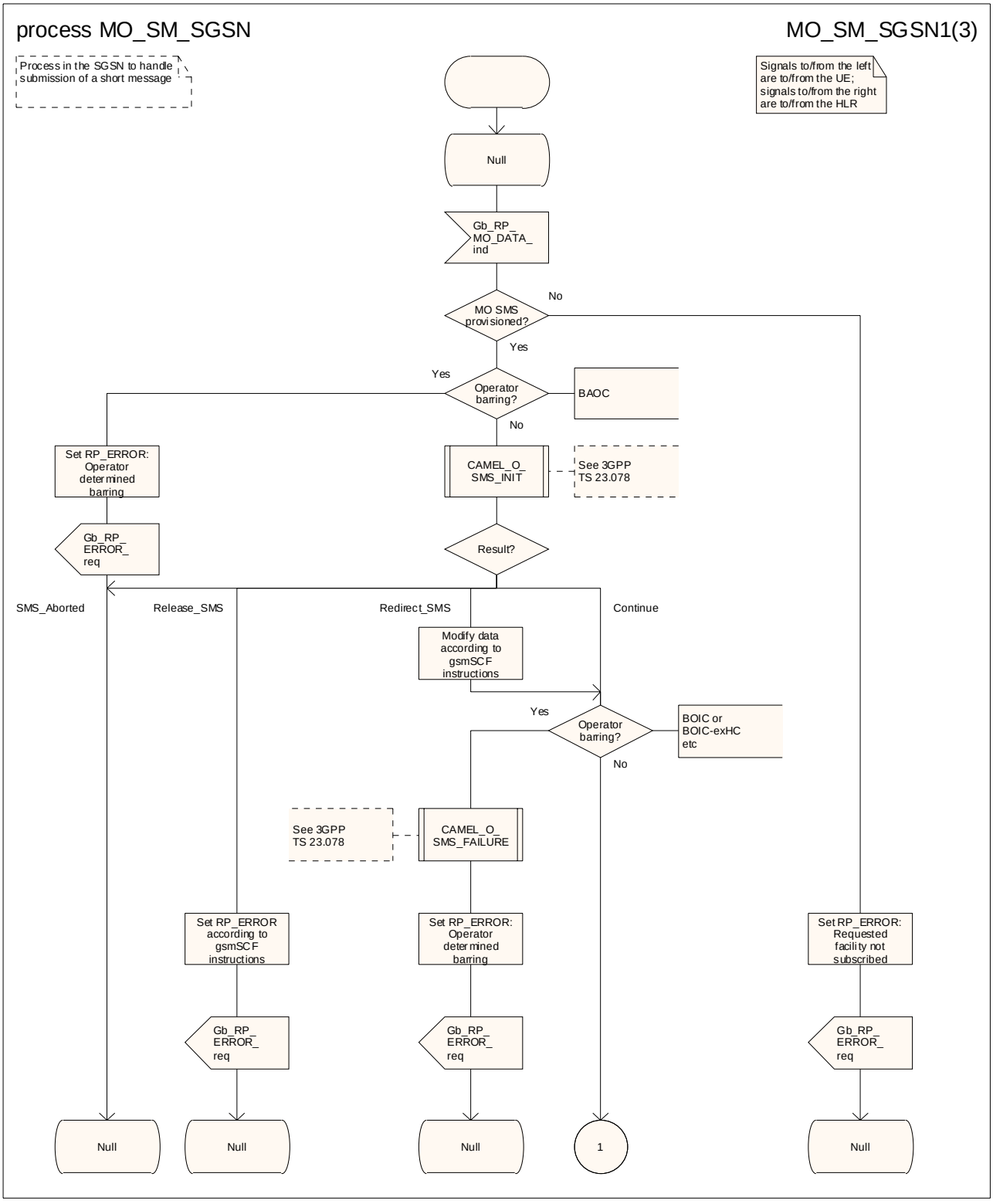
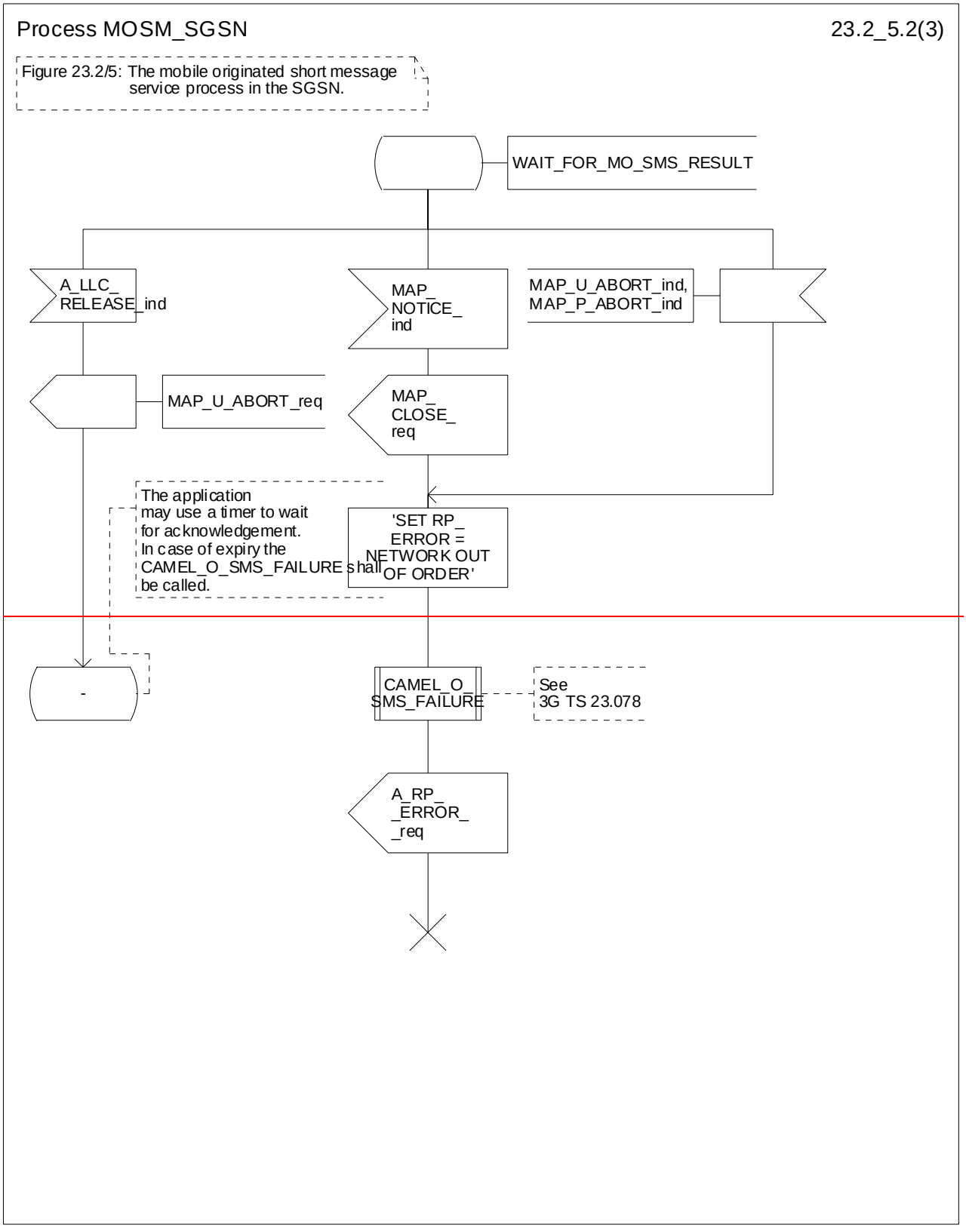


Figure 23.2/5 (sheet 1 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.2(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
WAIT_FOR_MO_SMS_RESULT
A_LLC_ RELEASE_ind
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind
MAP_U_ABORT_req
MAP_ CLOSE_ req
The application may use a timer to wait for acknowledgement. In case of expiry the CAMEL_O_SMS_FAILURE shall be called.
'SET RP_ ERROR = NETWORK OUT OF ORDER'
-
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
A_RP_ _ERROR_ _req

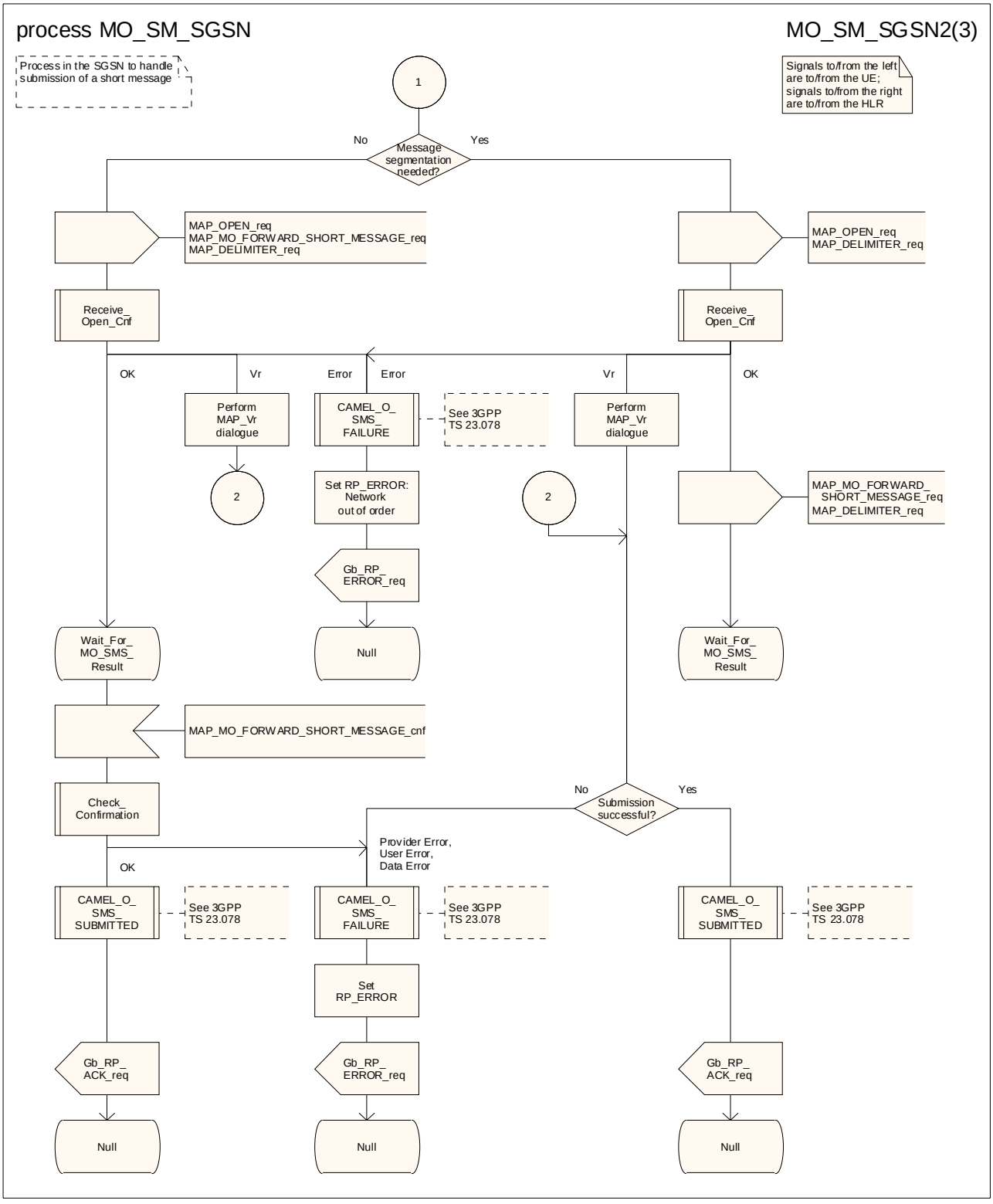
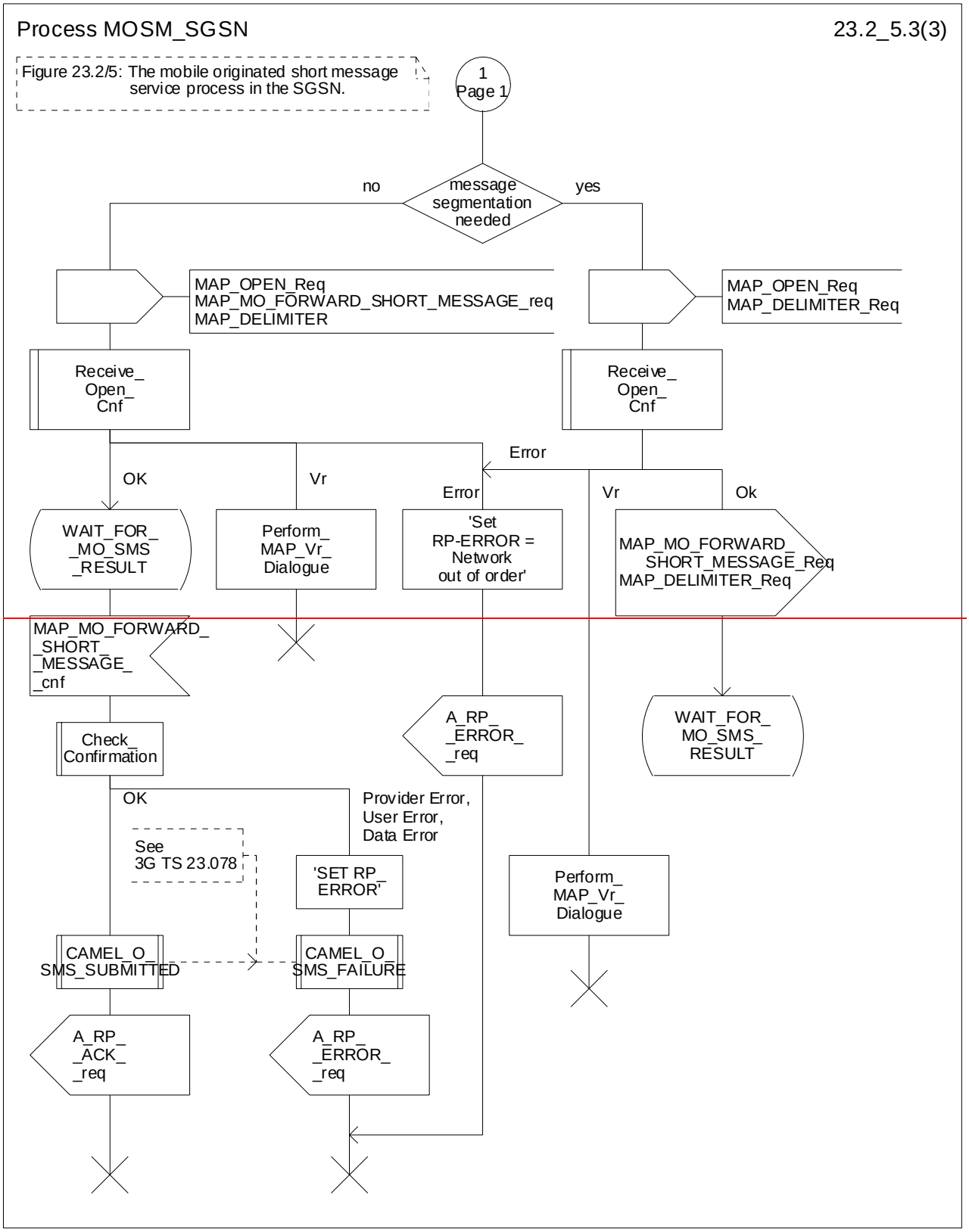


Figure 23.2/5 (sheet 2 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.3(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
1
Page 1
message segmentation needed
no
yes
MAP_OPEN_Req
MAP_MO_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
Vr
Error
Vr
Ok
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_Vr_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_MO_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_MO_FORWARD_ _SHORT_ _MESSAGE_ _cnf
A_RP_ _ERROR_ _req
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
OK
Provider Error, User Error, Data Error
See 3G TS 23.078
'SET RP_ ERROR'
Perform_ MAP_Vr_ Dialogue
CAMEL_O_ SMS_SUBMITTED
CAMEL_O_ SMS_FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req

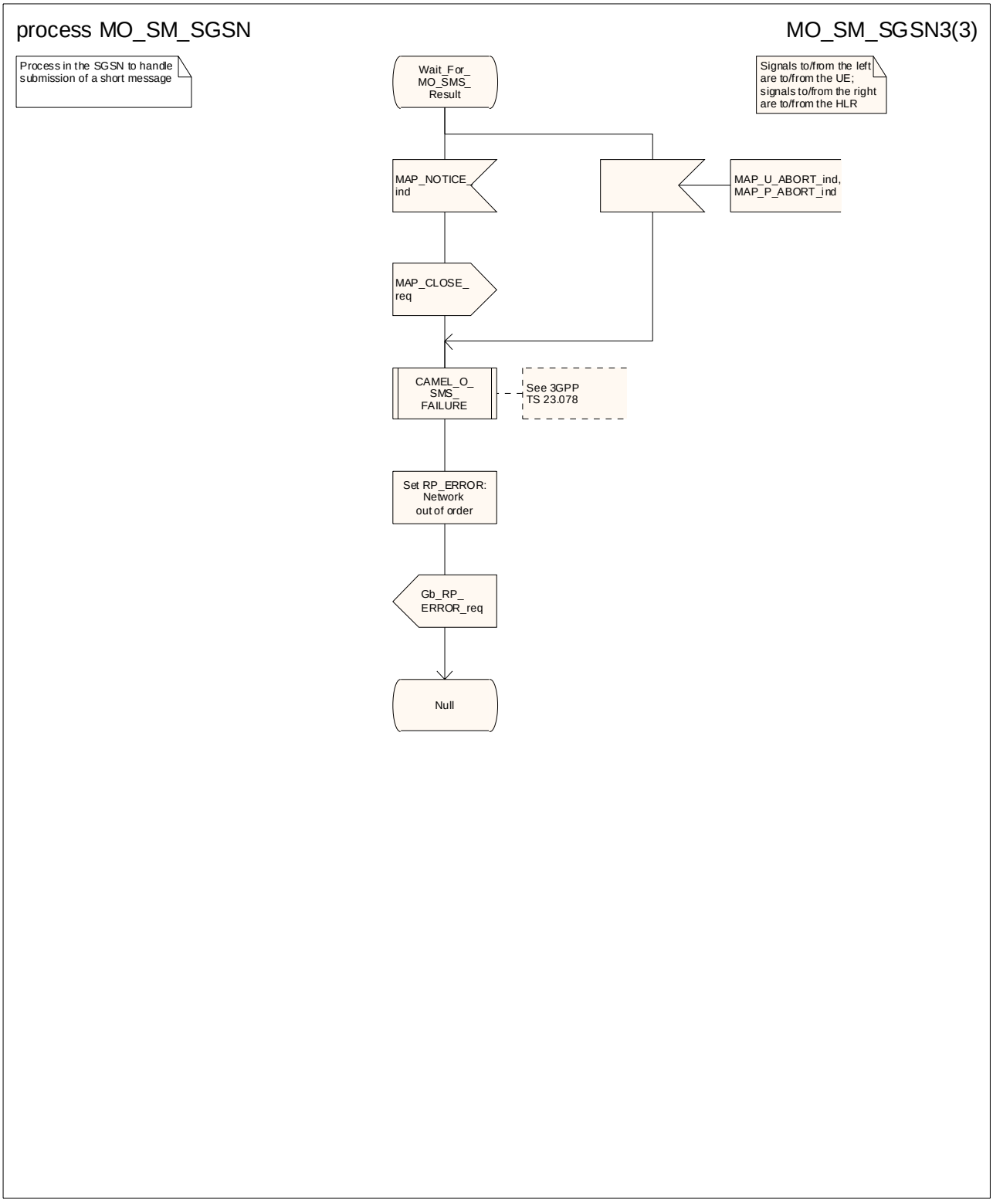


Figure 23.2/5 (sheet 3 of 3): Process MO_SM_SGSN

****** End of document ******

3GPP TSG CN Plenary Meeting #19
Birmingham, UK, 12th – 14th March 2003 **(Revision of N4-030258)**

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **543** ⌘ **rev** **2** ⌘ Current version: **4.10.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone, Lucent Technologies, L M Ericsson
Work item code:	⌘	CAMEL3
Date:	⌘	26/02/2003
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This requires changes to the processes MO_SMS_MSC and MO_SMS_VLR (text and SDL descriptions). Reflect the sequence of checking: BAOC (both ODB and SS in the MSC/VLR, ODB only in the SGSN); CAMEL handling; BOIC/BOIC-exHC (both ODB and SS in the MSC/VLR, ODB only in the SGSN), to reflect the description in 23.078.
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly, which can lead to complaints from subscribers about SMS submission not working when it should, or working (and being charged for) when it should not.

Clauses affected:	⌘	23.2.1, 23.2.2, 23.2.4

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		CR 23.078-528
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	The pretence of MAP dialogues between the MSC and the VLR leads to unnecessary complexity in the SDL diagrams (handling for MAP_NOTICE and MAP_P_ABORT, possibility of protocol version dropback). This has been removed, as a small step in the right direction. A text box has been added to each sheet of SDL which needs it, to state the convention for the source and destination of input and output signals. This has not been highlighted in the SDL diagrams.

**** First modified section ****

23.2.1 Procedure in the servicing MSC

Any CAMEL-specific handling defined in this subclause is omitted if the MSC does not support CAMEL control of MO SMS or if the subscriber does not have a subscription for CAMEL control of MO SMS.

~~The activation of the MAP_PROCESS_ACCESS_REQUEST service is described in the clause 25.4.1.~~

When the MSC receives~~ing~~ the short message from the A-interface, ~~the MSC~~it sends ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS request to the VLR~~. As~~ and waits for a response. While the MSC is waiting for a response from the VLR:

~~- if it receives a Release indication from the A-interface, it aborts the dialogue with the VLR, and the process terminates;~~

- if the VLR aborts, or prematurely closes, the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with error cause "Network out of order" to the MS, and the process terminates;

- if it receives a MAP_CONTINUE_CAMEL_SMS_HANDLING indication, it checks the indication.

  - if the indication is badly formed, the MSC sends an A_RP_ERROR with error cause "Network out of order" to the MS and aborts the dialogue with the VLR, and the process terminates;

  - if the indication is OK, the MSC calls the procedure CAMEL_O_SMS_INIT and tests the result.

    - if the result was "SMS_Aborted", the MSC aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Release_SMS", the MSC returns an A_RP_ERROR with an error cause as instructed by the gsmSCF to the MS and aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Redirect SMS", the MSC modifies the data for the submitted short message as instructed by the gsmSCF, sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress O-CSI set~~ and waits for a response;

    - if the result was "Continue", the MSC sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress O-CSI set~~ and waits for a response. The handling for this request is shown in the procedure CAMEL_MO_SMS_VLR (see 3GPP TS 23.078 [98]).

- if it ~~will~~ receives ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS confirmation from VLR, it checks the confirmation. ~~indicating that:~~

  - if the confirmation includes an error, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

  - if the confirmation indicates a successful result, the MSC checks whether the MSC is also the SMS-IWMSC.

    - if the MSC is separate from the SMS-IWMSC, MSC handling continues as described below under the heading "Serving MSC is separate from SMS-IWMSC".

    - if the MSC is also the SMS-IWMSC, the MSC handling continues as described below under the heading "Serving MSC is SMS-IWMSC";

Serving MSC is separate from SMS-IWMSC

The MSC checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;

  - if the dialogue opening is successful, the MSC waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the two requests cannot be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

  - if the dialogue opening is successful, the MSC sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

  - if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

  - if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol, and checks the result.

    - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

    - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

  ~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the MSC receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the confirmation indicates that the submission of the short message failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

~~- if the MSC receives a Release indication from the A interface, it aborts the dialogue with the SMS-IWMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the dialogue with the SMS-IWMSC fails, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates.

Serving MSC is SMS-IWMSC

The MSC sends an SC_RP_MO_DATA request to the Short Message Service Centre (SMSC), and waits for the response.

~~- if the MSC receives a Release indication from the A interface, it aborts the dialogue with the SMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the MSC receives an error response from the SMSC, it reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

- if the SMSC aborts the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the MSC receives a positive response from the SMSC, it reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates.

~~- the service ends successfully. If the MSC is not itself the IWMSC, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request;~~

~~- the service ends unsuccessfully. The error cause in the MAP_SEND_INFO_FOR_MO_SMS confirmation indicates the reason for the unsuccessful end. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26].~~

~~If there are data errors in the MAP_SEND_INFO_FOR_MO_SMS confirmation, or there is an operation failure in MAP, the RP_ERROR cause network out of order is forwarded to the mobile station.~~

~~The MSC opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS.~~

~~The MSC checks the barring as follows;~~

~~- if the short message transfer would contravene operator determined barring, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause operator barring is returned to MS;~~

~~- if the short message transfer would contravene the supplementary service call barring conditions, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause barring service active is returned to MS.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the MSC will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation. If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing MSC will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

~~- the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

~~- one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in the SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

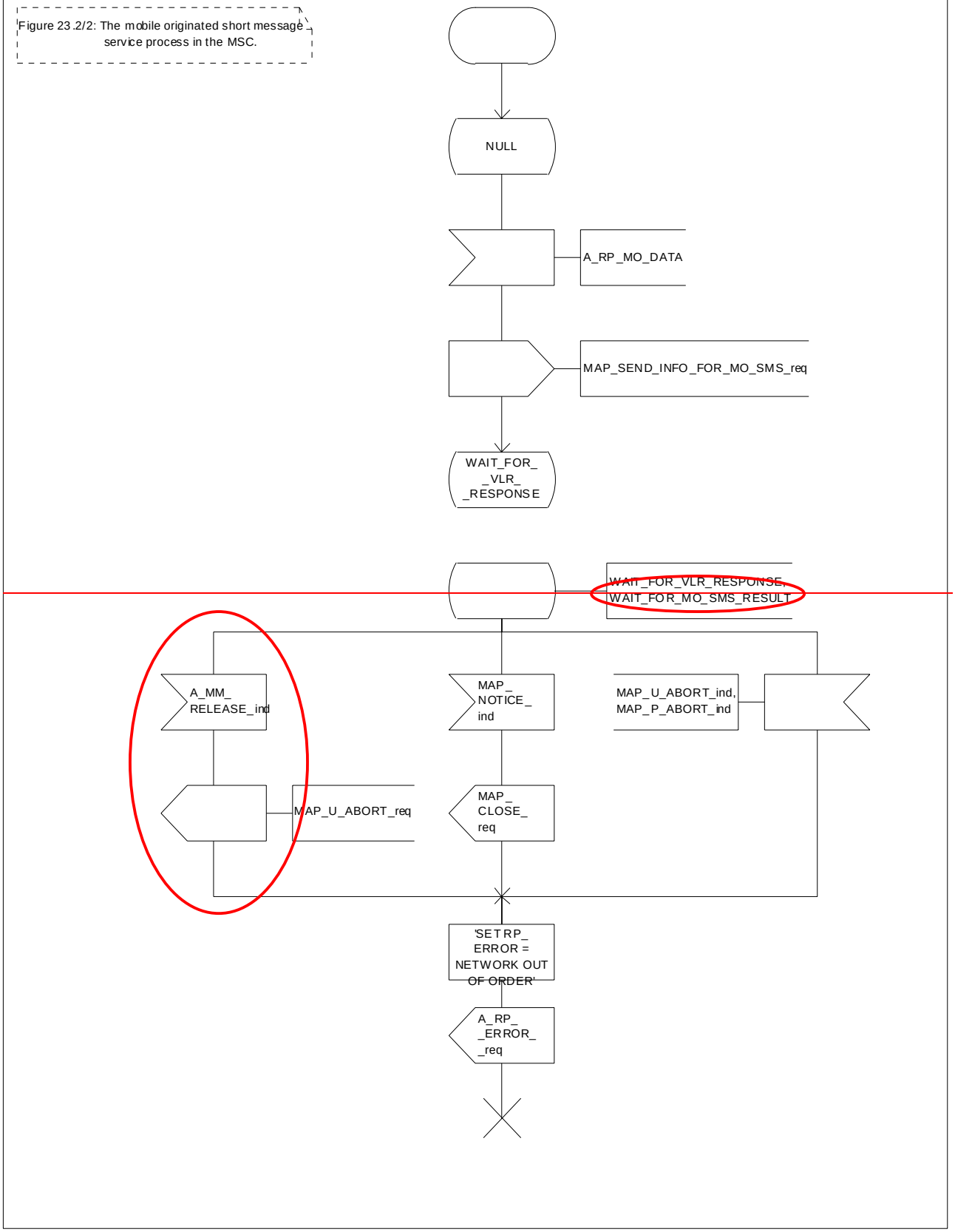
~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

~~If the MSC itself is the interworking MSC, the short message is forwarded to the Service Centre. In that case the service MAP_MO_FORWARD_SHORT_MESSAGE is not initiated. The acknowledgement message from the Service Centre is forwarded to the mobile station (3GPP TS 23.040[26], 3GPP TS 24.011 [37]).~~

The mobile originated short message service proces~~dure~~ in the MSC is shown in figure 23.2/2.

Process MOSM_MSC 23.2_2.1(3)

Figure 23.2/2: The mobile originated short message service process in the MSC.



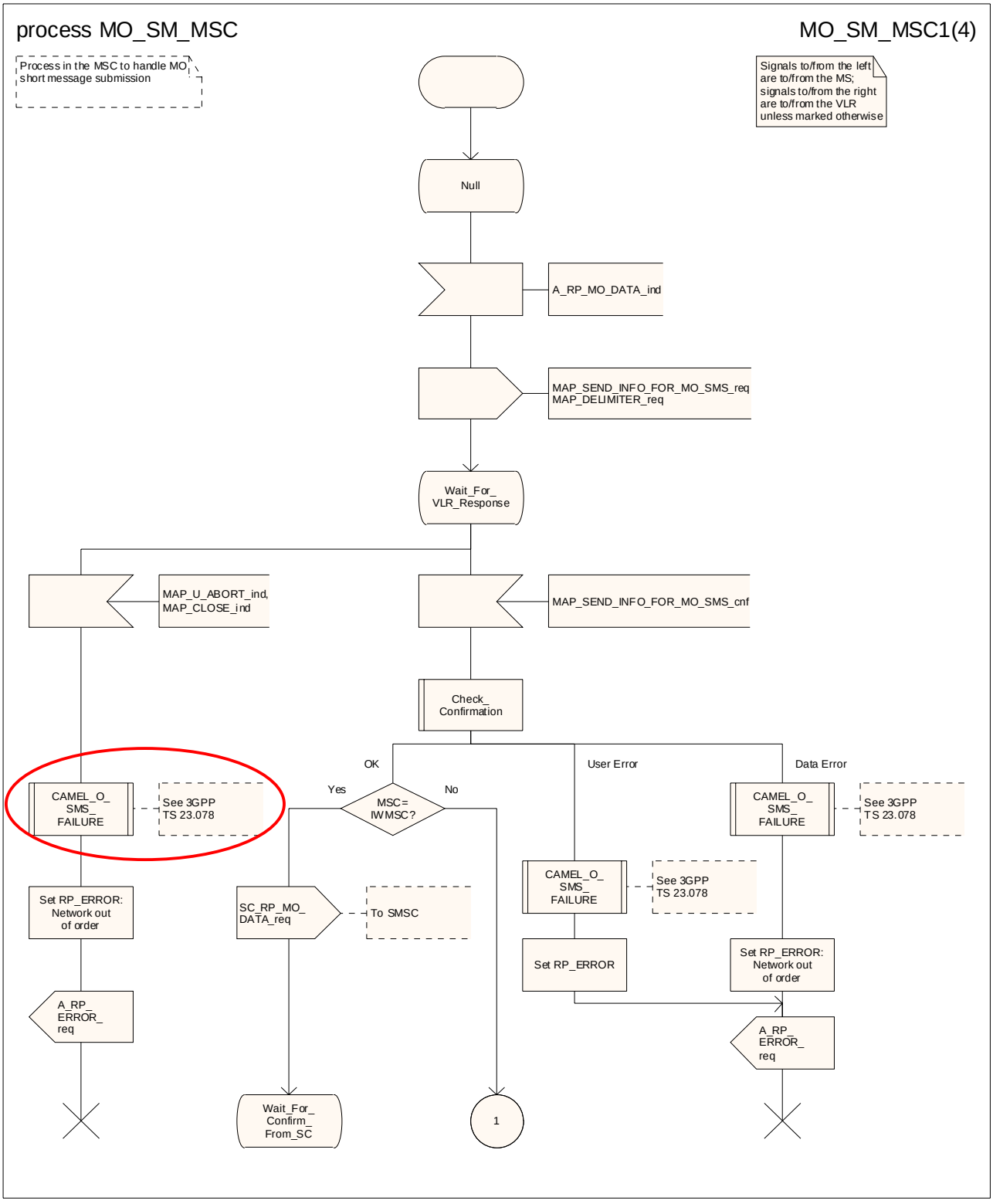
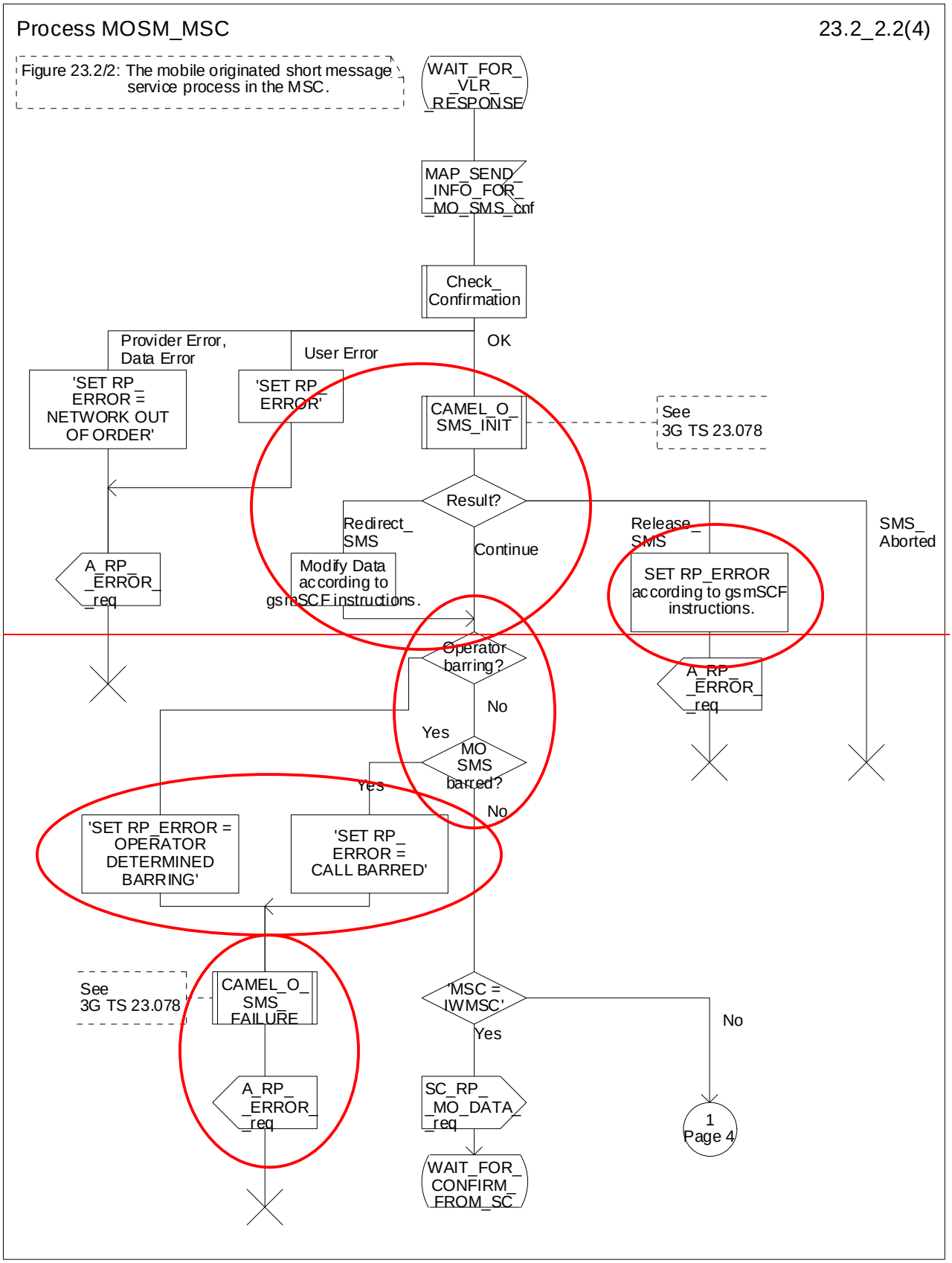


Figure 23.2/2 (sheet 1 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.2(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
WAIT_FOR_VLR_RESPONSE
MAP_SEND_INFO_FOR_MO_SMS_cnf
Check_Confirmation
Provider Error, Data Error
User Error
OK
'SET RP_ERROR = NETWORK OUT OF ORDER'
'SET RP_ERROR'
CAMEL_O_SMS_INIT
See 3G TS 23.078
Result?
Redirect_SMS
Continue
Release_SMS
SMS_Aborted
A_RP_ERROR_req
Modify Data according to gsmSCF instructions.
SET RP_ERROR according to gsmSCF instructions.
Operator barring?
No
Yes
MO SMS barred?
Yes
No
'SET RP_ERROR = OPERATOR DETERMINED BARRING'
'SET RP_ERROR = CALL BARRED'
See 3G TS 23.078
CAMEL_O_SMS_FAILURE
'MSC = IWMSC'
No
Yes
A_RP_ERROR_req
SC_RP_MO_DATA_req
1 Page 4
WAIT_FOR_CONFIRM_FROM_SC

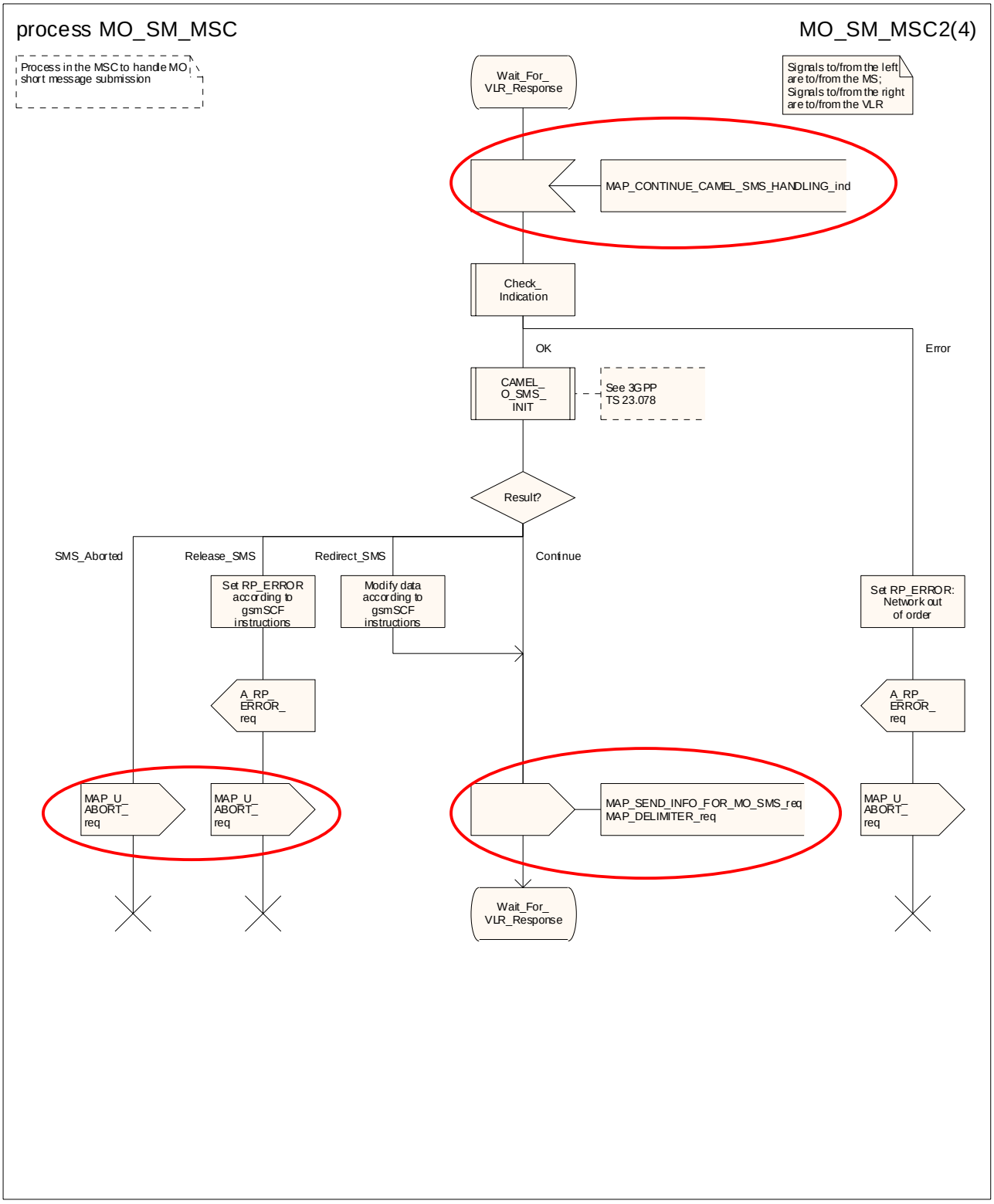
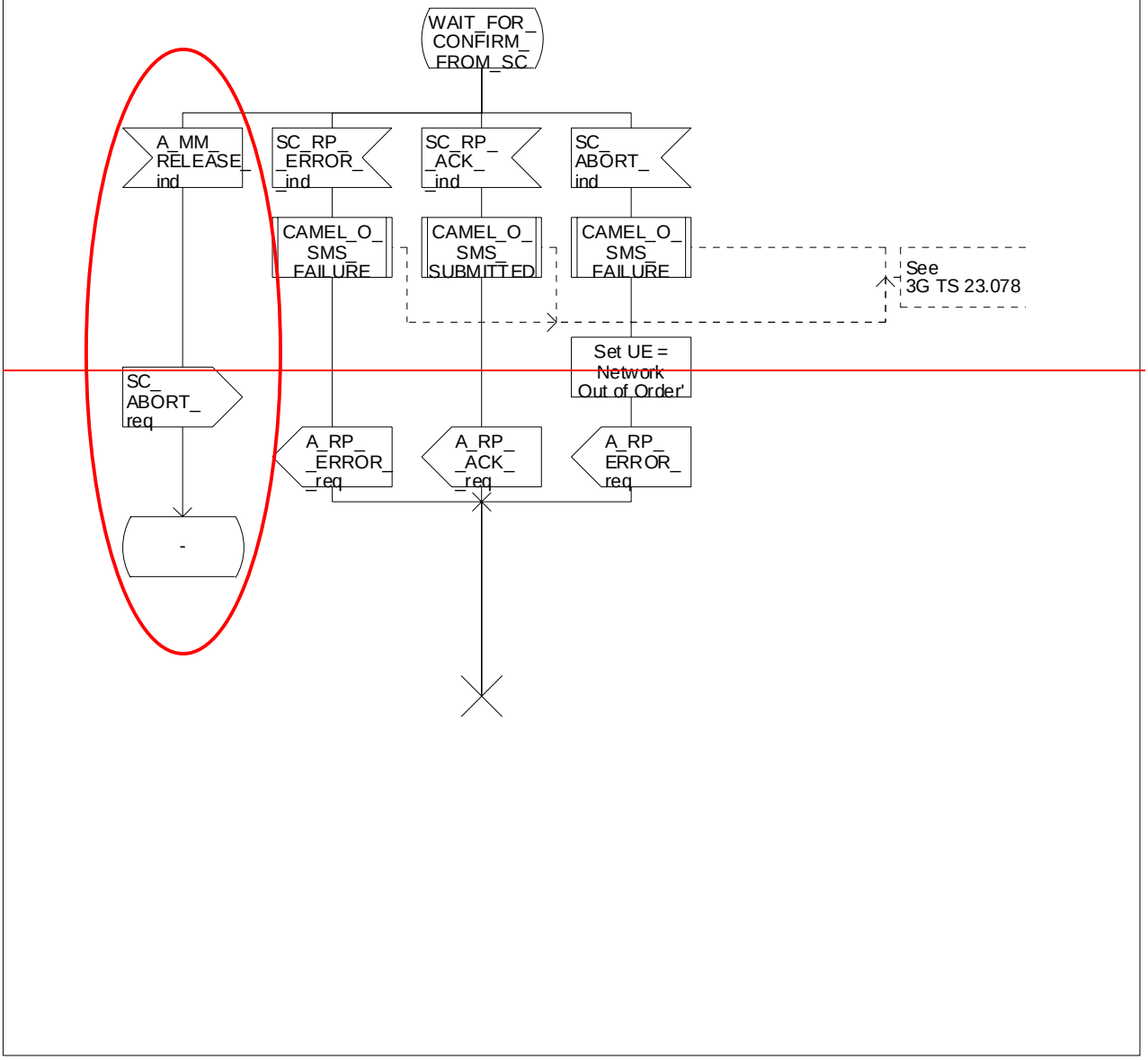


Figure 23.2/2 (sheet 2 of 4): Process MO_SM_MSC

Process MOSM_MSC 23.2_2.new3(4)

Figure 23.2/2: The mobile originated short message service process in the MSC.



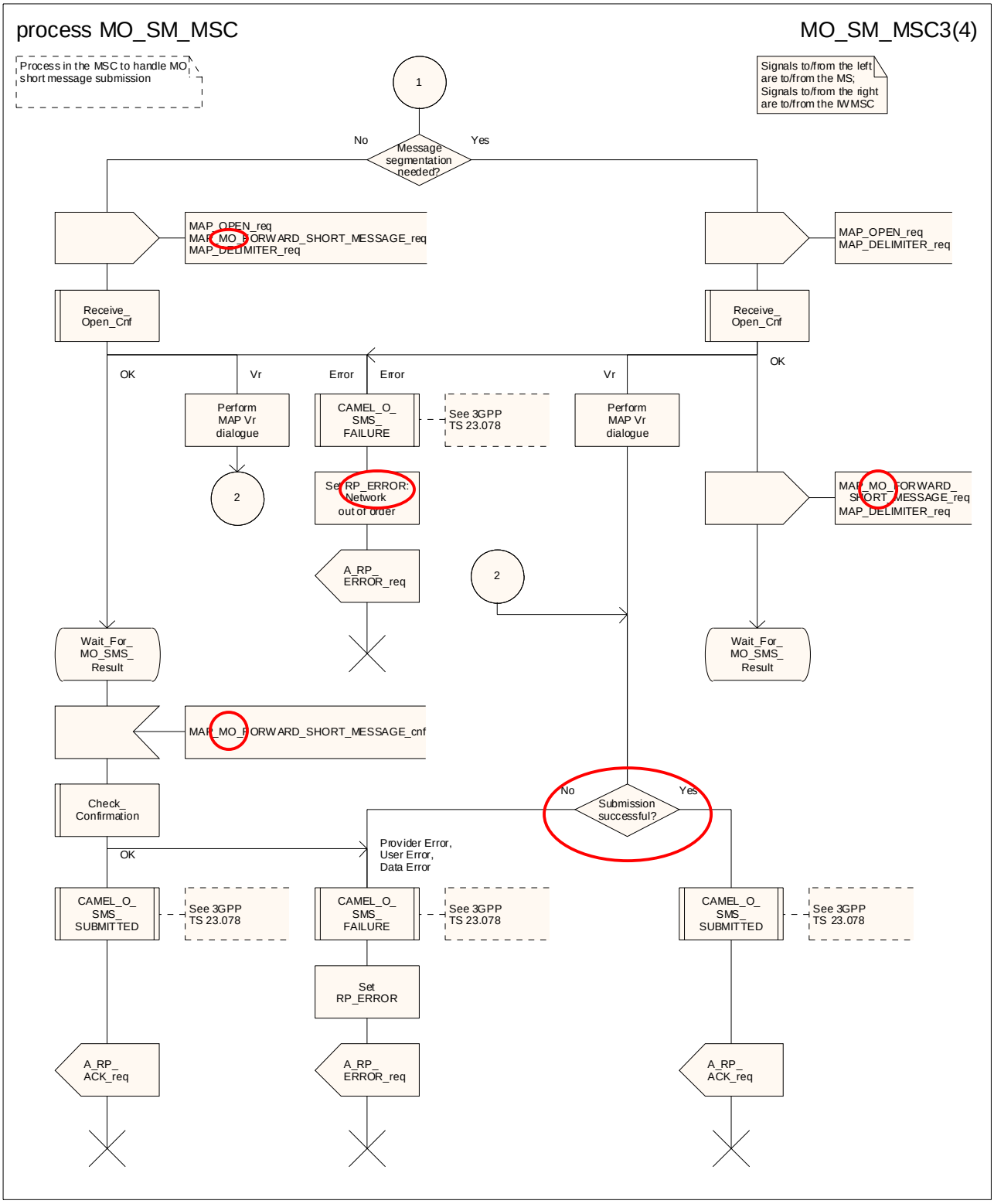
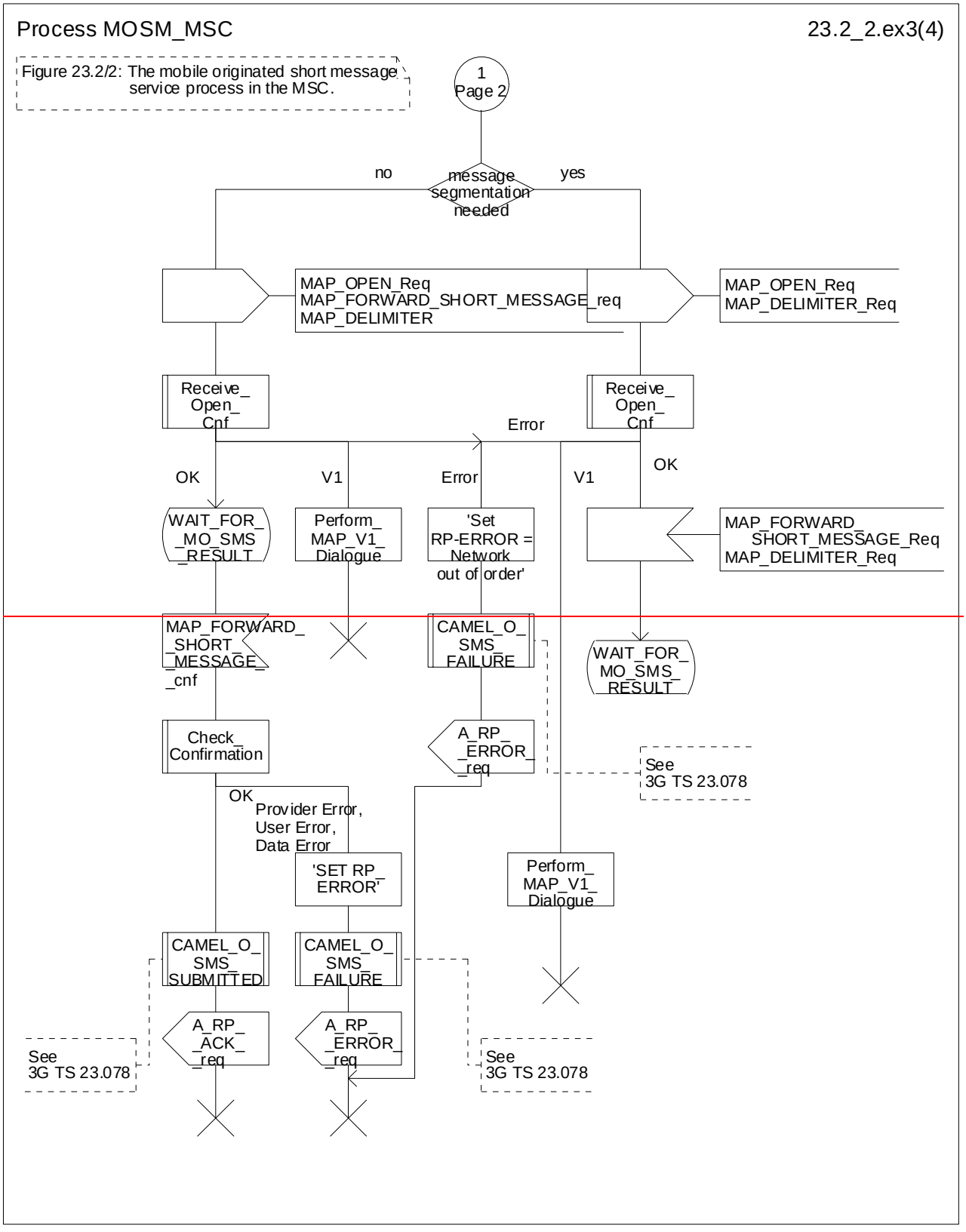


Figure 23.2/2 (sheet 3 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.ex3(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
1
Page 2
no
message segmentation needed
yes
MAP_OPEN_Req
MAP_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
V1
Error
V1
OK
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_V1_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_FORWARD_ _SHORT_ _MESSAGE_ _cnf
CAMEL_O_ SMS_ FAILURE
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
A_RP_ _ERROR_ _req
See 3G TS 23.078
OK
Provider Error, User Error, Data Error
'SET RP_ ERROR'
Perform_ MAP_V1_ Dialogue
CAMEL_O_ SMS_ SUBMITTED
CAMEL_O_ SMS_ FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req
See 3G TS 23.078
See 3G TS 23.078

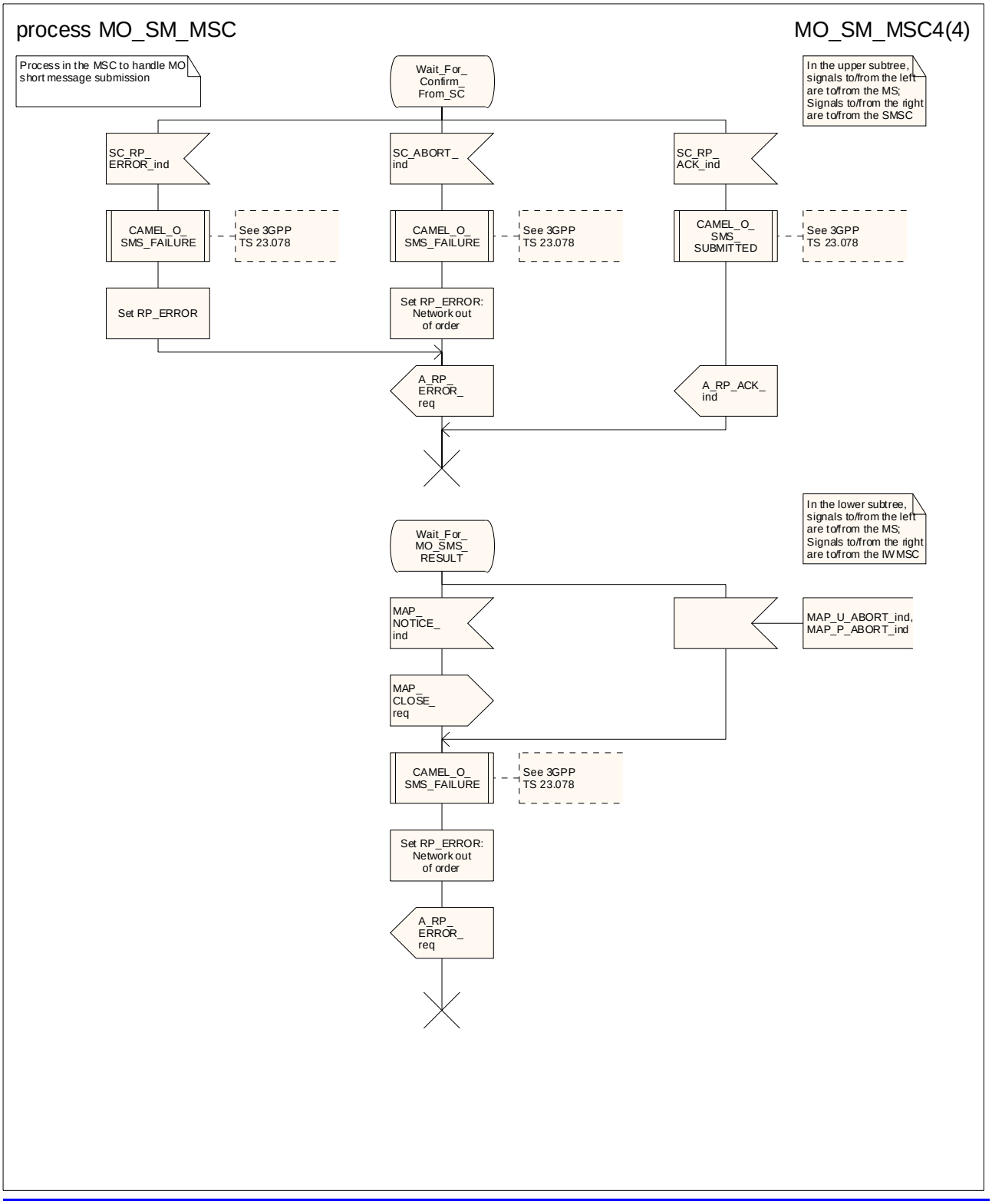


Figure 23.2/2 (sheet 4 of 4): Process MO_SM_MSC

23.2.2 Procedure in the VLR

Any CAMEL-specific handling defined in this subclause is omitted if the VLR does not support CAMEL control of MO SMS.

The process is triggered by a dialogue opening request followed by a MAP_PROCESS_ACCESS_REQUEST including a CM service type Short Message Service.

If the macro Process_Access_Request_VLR takes the "OK" exit, the VLR waits for a MAP_SEND_INFO_FOR_MO_SMS indication from the MSC.

- If the MSC aborts the dialogue, the process returns to the Null state;
- if the indication is badly formed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the appropriate user error;
- if the indication is OK, the VLR checks whether the submission of the short message is allowed
  - if MO SMS is not provisioned, VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Teleservice not provisioned";
  - if the submission of the short message is prevented by Operator Determined Barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by supplementary service barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - the VLR calls the procedure CAMEL_MO_SMS_VLR and checks the result.
    - if the result is "Fail", the process returns to the Null state;
    - if the result is "Pass", the VLR continues to check the subscription information.
  - if the submission of the short message is prevented by Operator Determined Barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by ~~the Barring~~ supplementary service barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - if the submission of the short message is allowed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the MSISDN of the requesting subscriber..

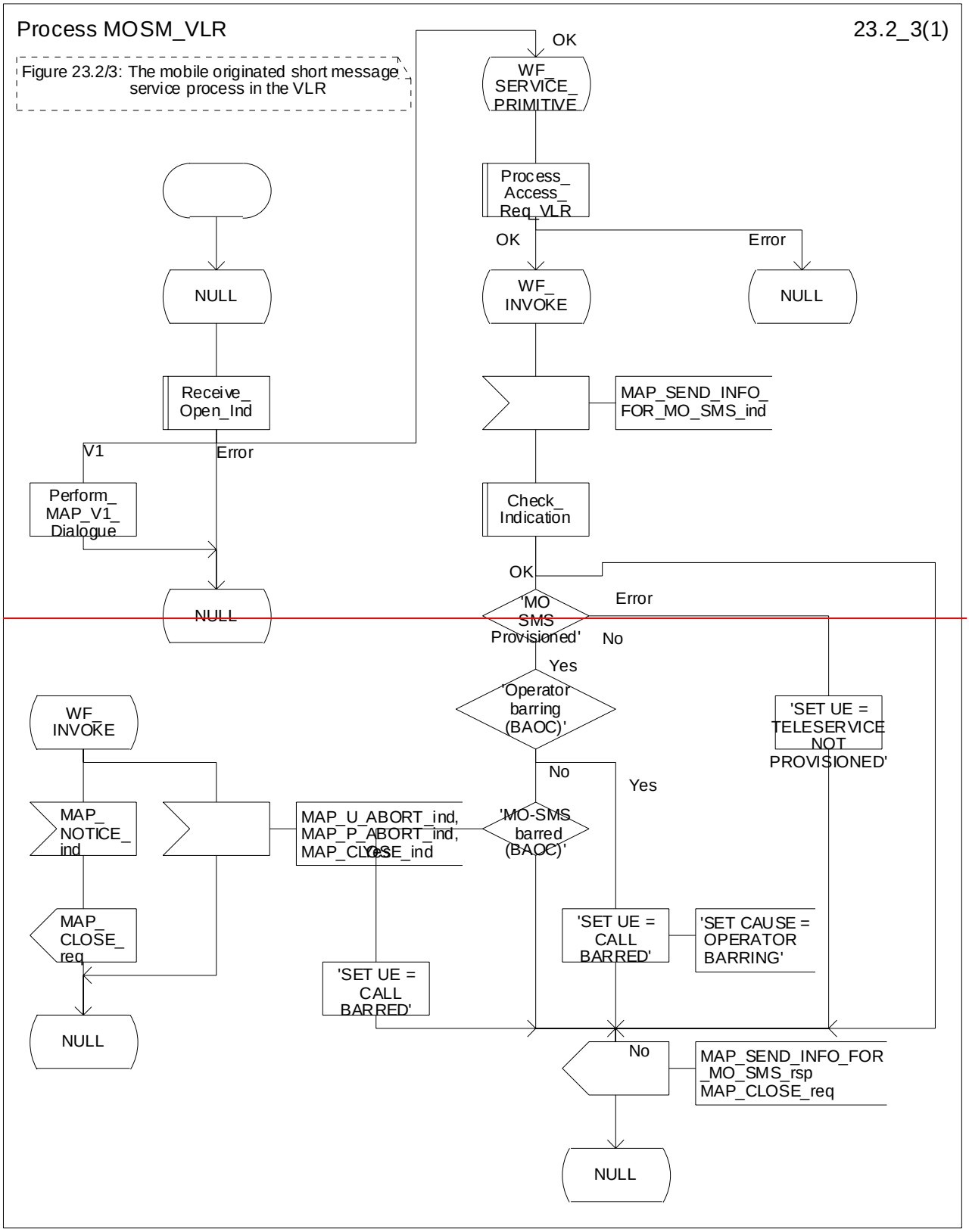
When the VLR has returned the MAP_SEND_INFO_FOR_MO_SMS response, the process returns to the Null state.

~~The MAP_PROCESS_ACCESS_REQUEST indication starts the MAP_PROCESS_ACCESS_REQUEST service in the VLR. The application context in the MAP_OPEN indication is mobile originated short message transfer.~~

~~If the service MAP_PROCESS_ACCESS_REQUEST is successful, the VLR waits for the next message from the MSC. When receiving the MAP_SEND_INFO_FOR_MO_SMS indication, the VLR acts as follows:~~

- ~~if there is incompatibility in the subscription check, the error teleservice not provisioned is returned to the MSC;~~
- ~~if the short message transfer would contravene Operator determined Barring (BAOC), the call barred error with cause operator barring is returned;~~
- ~~if the short message transfer would contravene the supplementary service call barring conditions (BAOC)in the VLR, the call barred error with cause barring service active is returned.~~

~~When the mobile subscriber has passed all checks, the MAP_SEND_INFO_FOR_MO_SMS response is initiated and the procedure is terminated in the VLR.~~ The mobile originated short message transfer process~~dure~~ in the VLR is shown in figure 23.2/3.


Process MOSM_VLR
23.2_3(1)
Figure 23.2/3: The mobile originated short message service process in the VLR
OK
WF_ SERVICE_ PRIMITIVE
Process_ Access_ Req_VLR
OK
Error
NULL
WF_ INVOKE
NULL
Receive_ Open_Ind
MAP_SEND_INFO_ FOR_MO_SMS_ind
V1
Error
Perform_ MAP_V1_ Dialogue
Check_ Indication
OK
NULL
'MO SMS Provisioned'
Error
No
Yes
'Operator barring (BAOC)'
WF_ INVOKE
'SET UE = TELESERVICE NOT PROVISIONED'
No
Yes
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind, MAP_CLOSE_ind
'MO-SMS barred (BAOC)'
MAP_ CLOSE_ req
'SET UE = CALL BARRED'
'SET UE = CALL BARRED'
'SET CAUSE = OPERATOR BARRING'
NULL
No
MAP_SEND_INFO_FOR _MO_SMS_rsp MAP_CLOSE_req
NULL

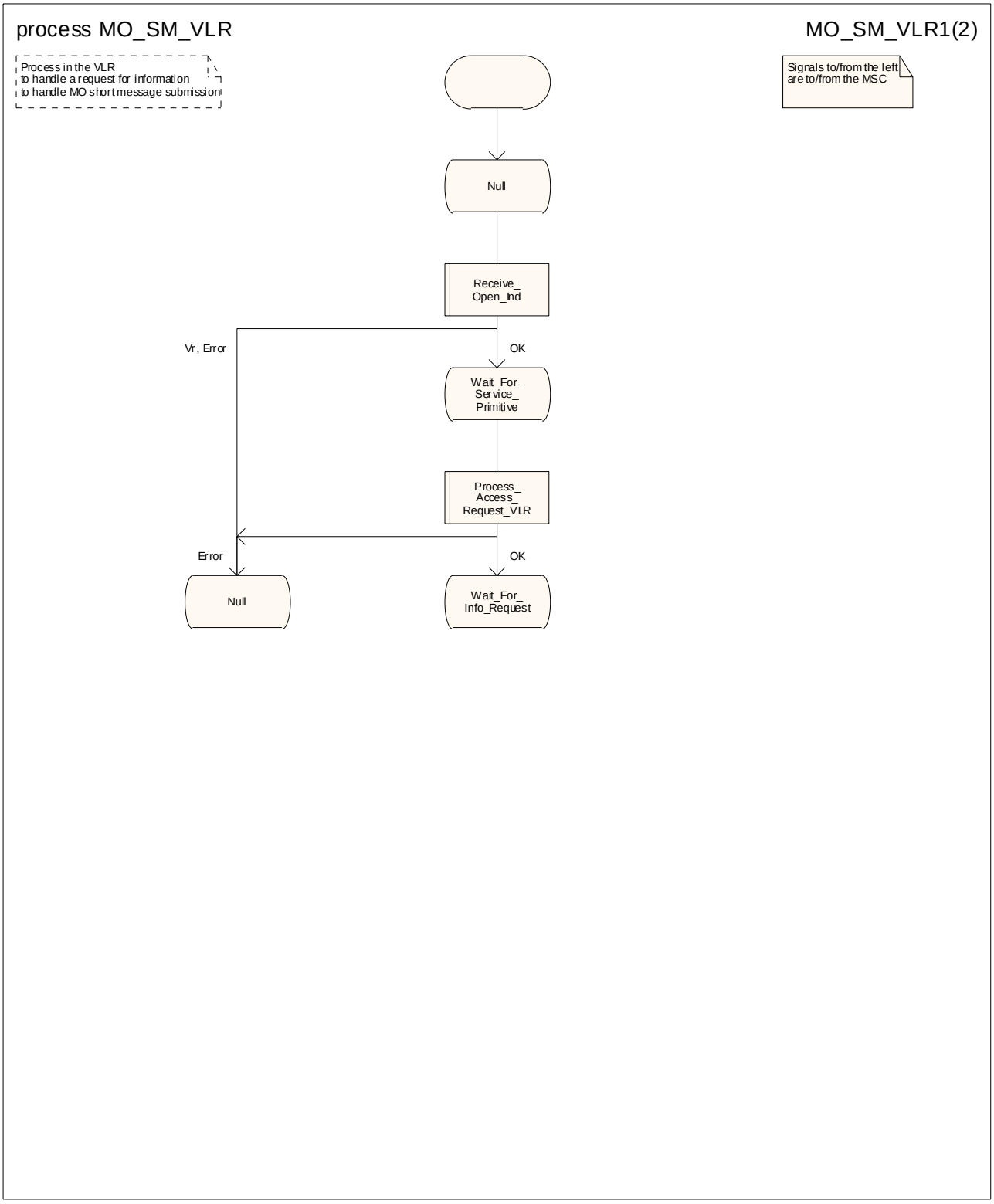


Figure 23.2/3(sheet 1 of 2): Process MO_SM_VLR

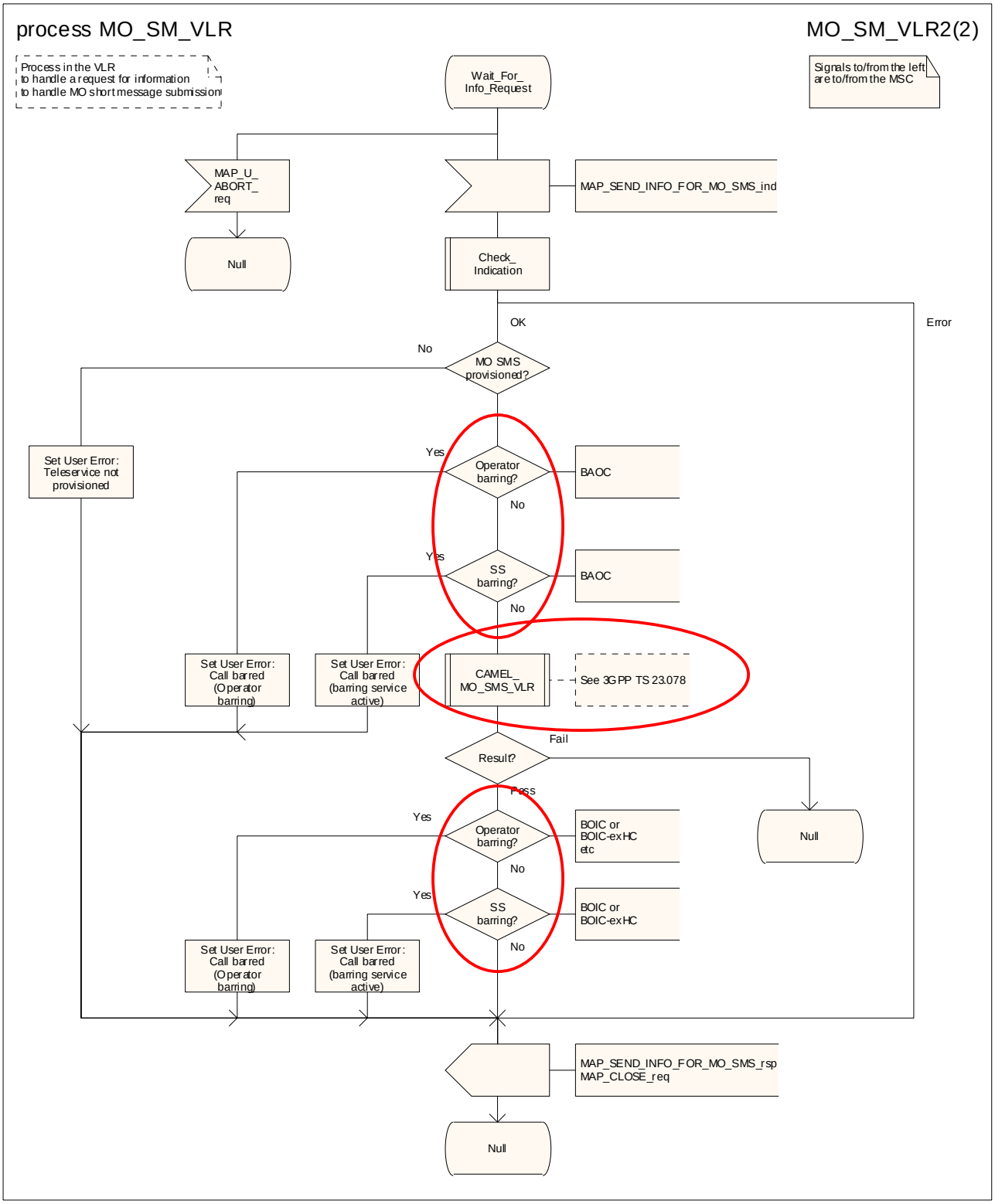


Figure 23.2/3(sheet 2 of 2): Process MO_SM_VLR

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

23.2.4 Procedure in the ~~servicing~~ SGSN

Any CAMEL-specific handling defined in this subclause is omitted if the SGSN does not support CAMEL control of MO SMS, or if the subscriber is not a CAMEL subscriber.

The process is triggered by a short message received from the MS over the Gb interface.

If the MO SMS service is not provisioned, the SGSN returns a Gb_RP_ERROR with error cause "Requested facility not subscribed", and the process returns to the Null state.

If the MO SMS service is provisioned, the SGSN checks whether Operator Determined Barring of all outgoing calls is in force.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN calls the procedure CAMEL_O_SMS_INIT and tests the result.

- if the result was "SMS_Aborted", the process returns to the Null state;
- if the result was "Release_SMS", the SGSN returns a Gb_RP_ERROR with an error cause as instructed by the gsmSCF to the MS, and the process returns to the Null state;
- if the result was "Redirect_SMS", the SGSN modifies the data for the submitted short message as instructed by the gsmSCF, and the MSC handling continues;
- if the result was "Continue", the SGSN handling continues.

The SGSN checks whether Operator Determined Barring of outgoing calls (other than barring of all outgoing calls) would prevent the submission of the short message.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;
  - if the dialogue opening is successful, the SGSN waits for the response from the SMS-IWMSC;
  - if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.
  - if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.
    - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;
    - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.
- if the two requests cannot be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

- if the dialogue opening is successful, the SGSN sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

- if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.

- if the SGSN receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the confirmation indicates that the submission of the short message failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state;

- if the dialogue with the SMS-IWMSC fails, the SGSN reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

~~When receiving the short message from the MS, the SGSN acts as follows:~~

- ~~if there is incompatibility in the subscription check, the RP_ERROR cause requested facility not subscribed is provided to the mobile station;~~

- ~~the SGSN opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS;~~

- ~~if the short message transfer would contravene operator determined barring, , the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the RP_ERROR cause operator determined barring is provided to the mobile station;~~

~~NOTE: The RP_ERROR causes are described in 3GPP TS 24.011 [37].~~

- ~~if no error is detected, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the SGSN will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation.~~

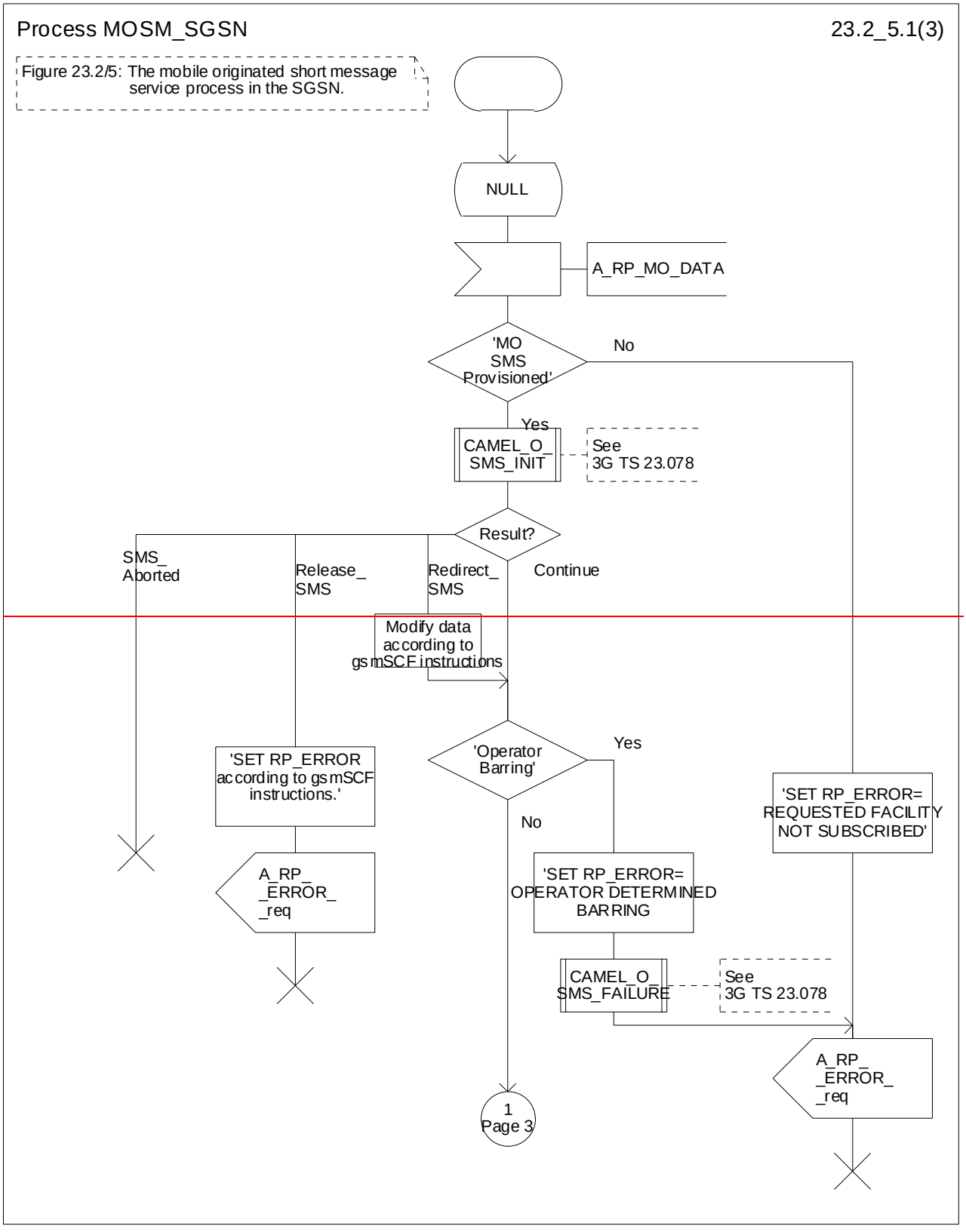
~~If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing SGSN will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

- ~~the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

- ~~one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

The mobile originated short message service proces~~sdure~~ in the SGSN is shown in figure 23.2/5.


Process MOSM_SGSN
23.2_5.1(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
NULL
A_RP_MO_DATA
'MO SMS Provisioned'
No
Yes
CAMEL_O_ SMS_INIT
See 3G TS 23.078
Result?
SMS_ Aborted
Release_ SMS
Redirect_ SMS
Continue
Modify data according to gsmSCF instructions
'Operator Barring'
Yes
No
'SET RP_ERROR according to gsmSCF instructions.'
A_RP_ _ERROR_ _req
'SET RP_ERROR= OPERATOR DETERMINED BARRING
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
'SET RP_ERROR= REQUESTED FACILITY NOT SUBSCRIBED'
A_RP_ _ERROR_ _req
1 Page 3

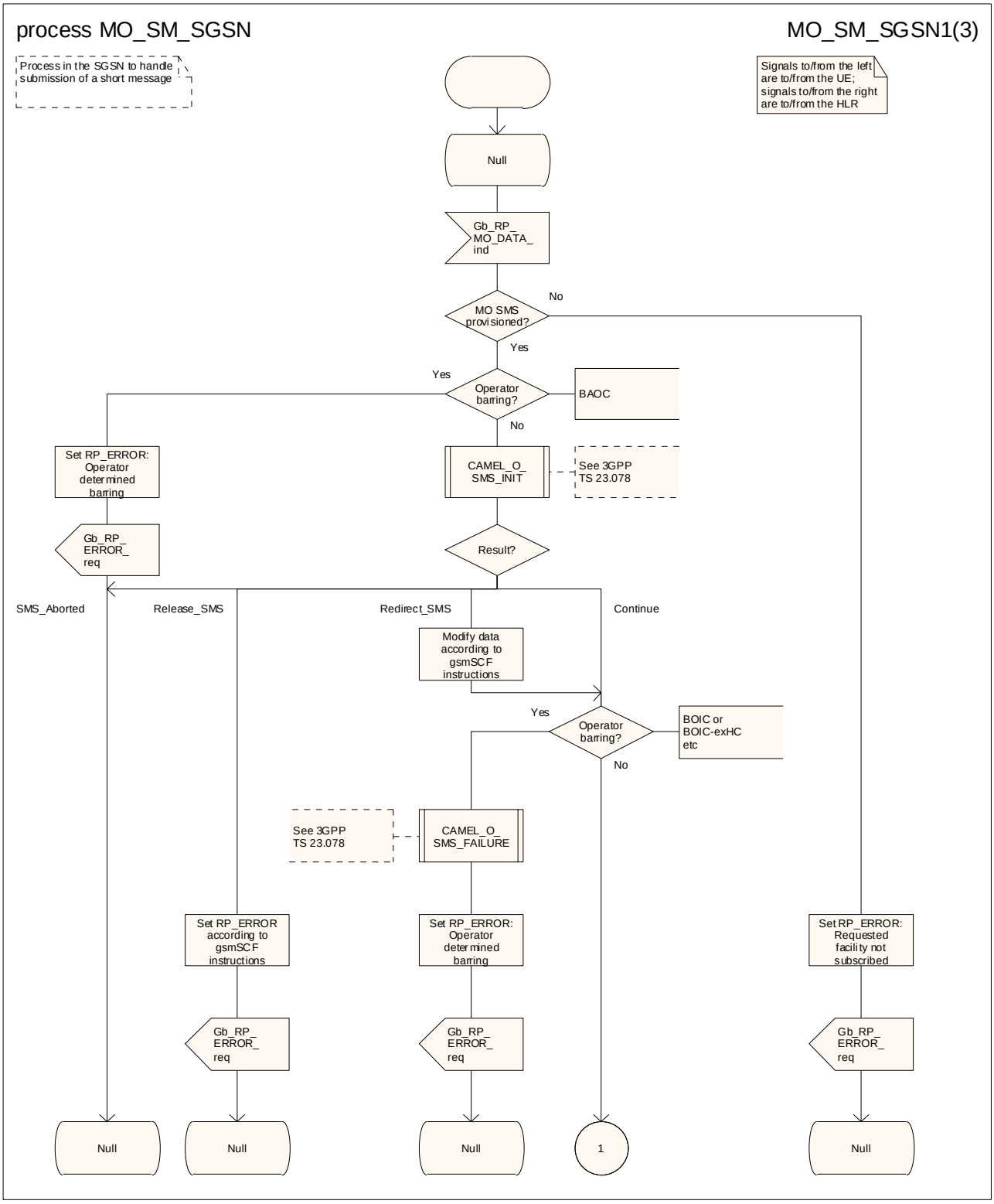
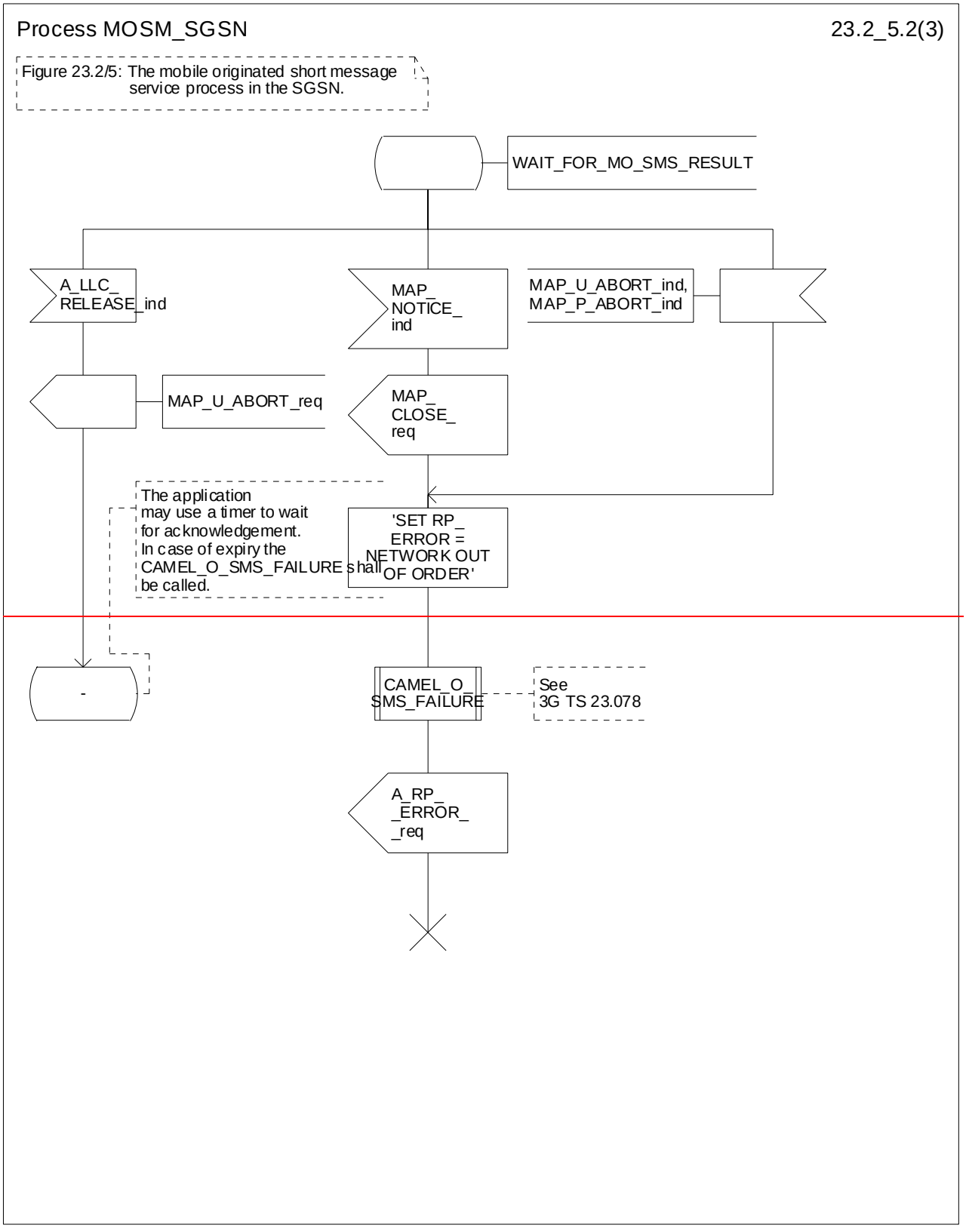


Figure 23.2/5 (sheet 1 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.2(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
WAIT_FOR_MO_SMS_RESULT
A_LLC_ RELEASE_ind
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind
MAP_U_ABORT_req
MAP_ CLOSE_ req
The application may use a timer to wait for acknowledgement. In case of expiry the CAMEL_O_SMS_FAILURE shall be called.
'SET RP_ ERROR = NETWORK OUT OF ORDER'
-
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
A_RP_ _ERROR_ _req

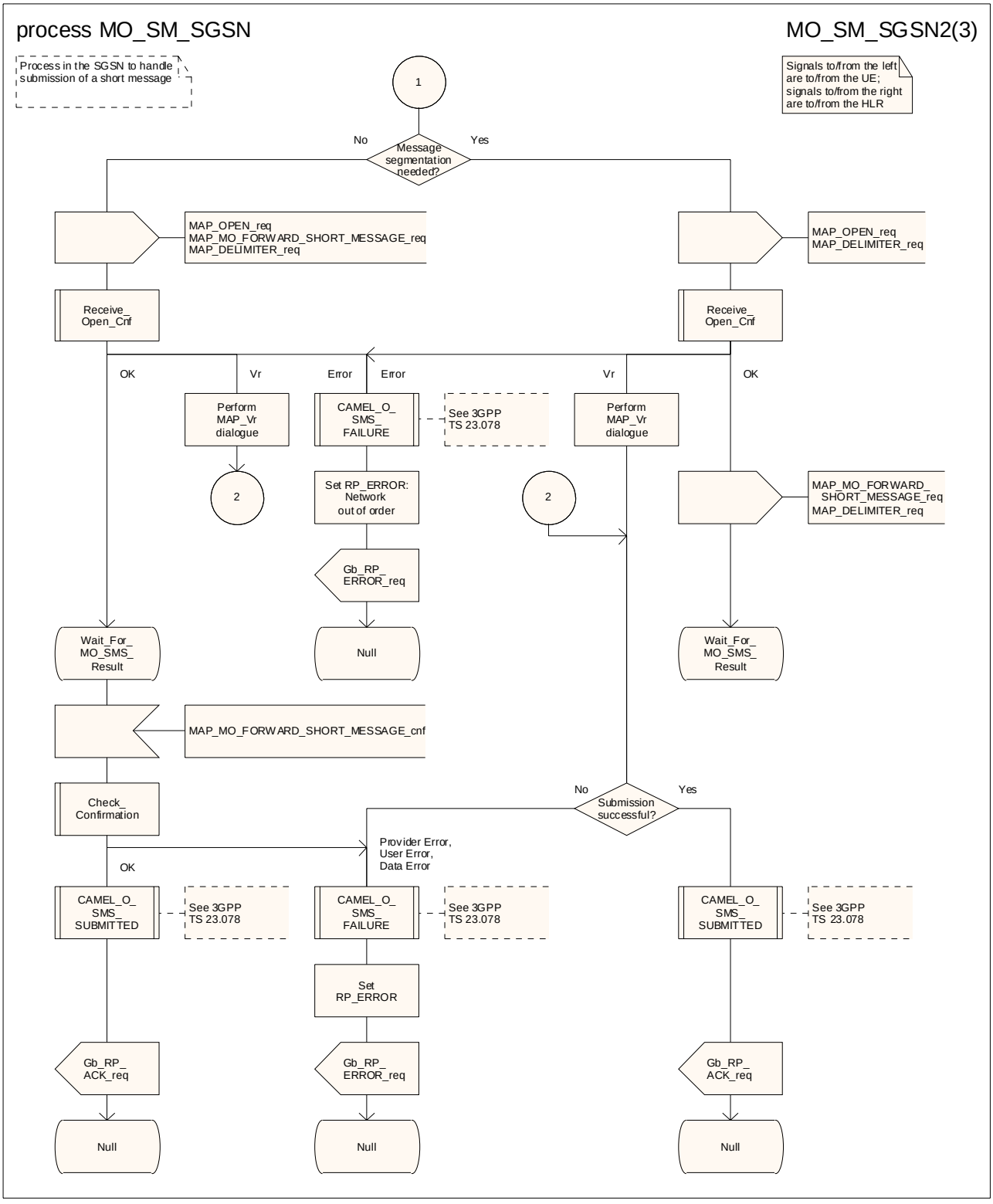
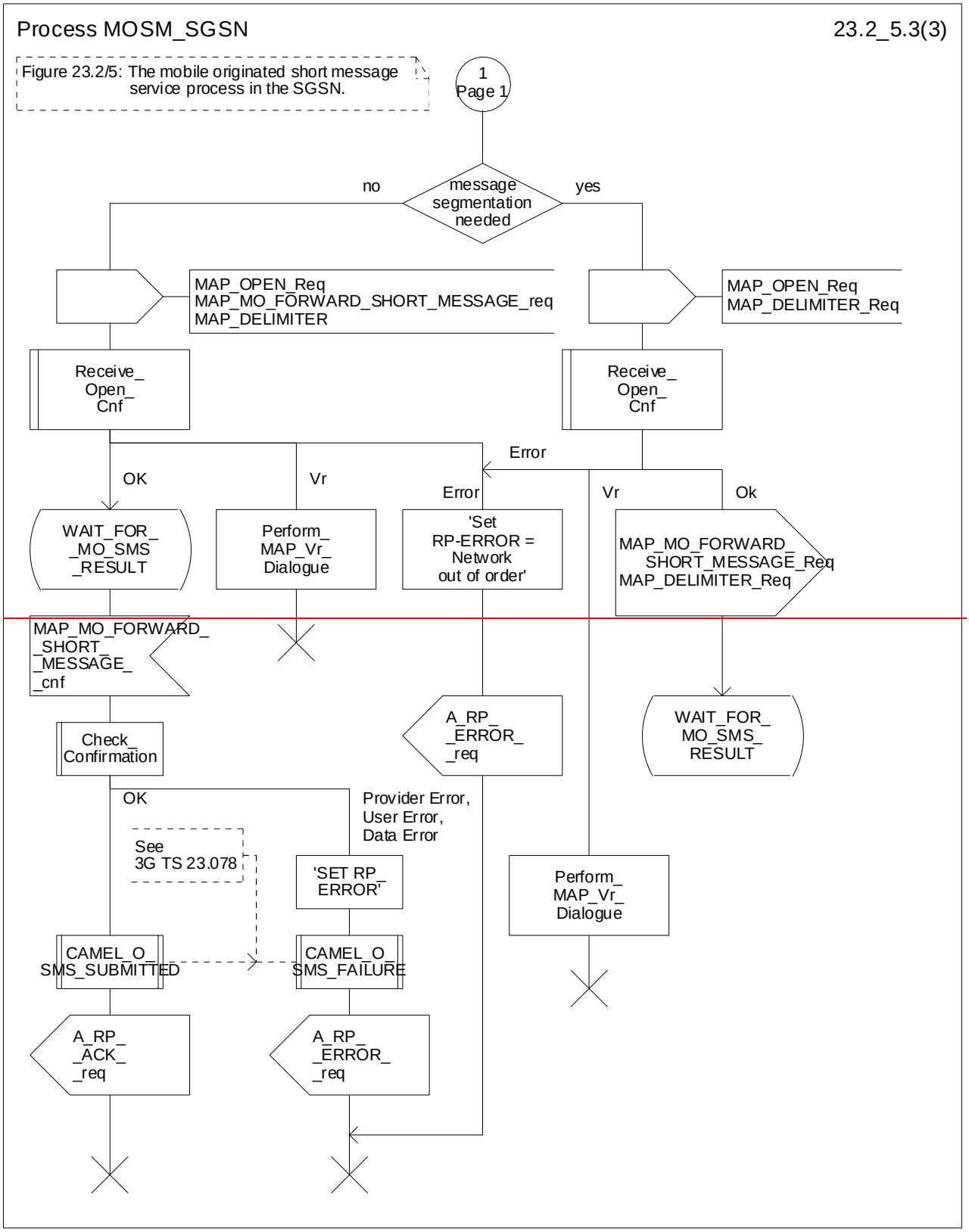


Figure 23.2/5 (sheet 2 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.3(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
1
Page 1
message segmentation needed
no
yes
MAP_OPEN_Req
MAP_MO_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
Vr
Error
Vr
Ok
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_Vr_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_MO_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_MO_FORWARD_ _SHORT_ _MESSAGE_ _cnf
A_RP_ _ERROR_ _req
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
OK
Provider Error, User Error, Data Error
See 3G TS 23.078
'SET RP_ ERROR'
Perform_ MAP_Vr_ Dialogue
CAMEL_O_ SMS_SUBMITTED
CAMEL_O_ SMS_FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req

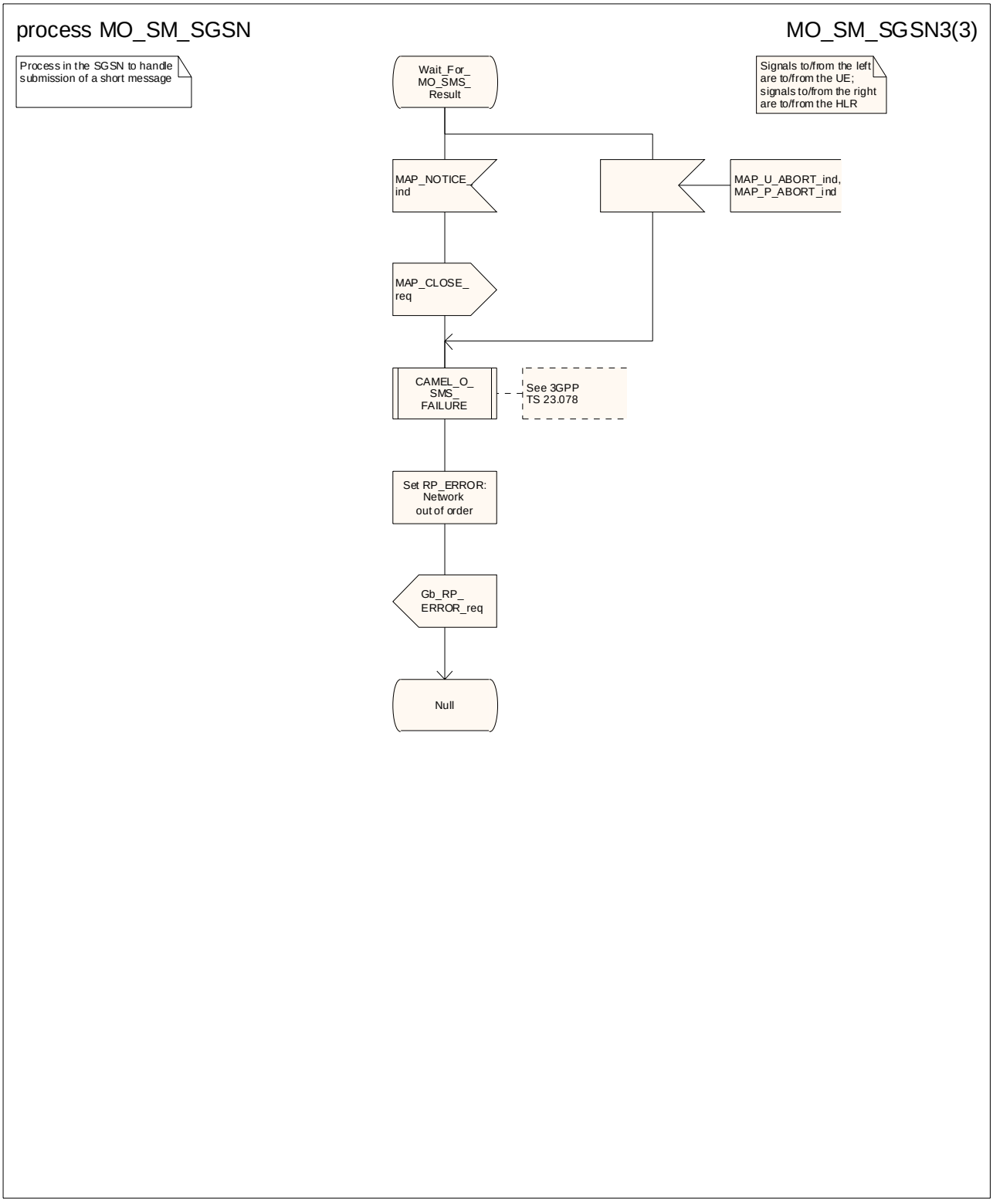


Figure 23.2/5 (sheet 3 of 3): Process MO_SM_SGSN

****** End of document ******

3GPP TSG CN WG2 Meeting #28 ***N2-030105***
Dublin, EIRE, 10th – 14th February 2003 **(Revision of N2-030054)**

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** **528** ⌘**rev** **1** ⌘ Current version: **4.7.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone
Work item code:	⌘	CAMEL3
Date:	⌘	11/02/2003
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This introduces a new procedure, CAMEL_MO_SMS_VLR, which is called from the main process (which is described in TS 29.002 clause 23)
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly, which can lead to complaints from subscribers about SMS submission not working when it should, or working (and being charged for) when it should not.

Clauses affected:	⌘	7.5.2.1A (new)			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘ CR 29.002-543
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

**** First modified section ****

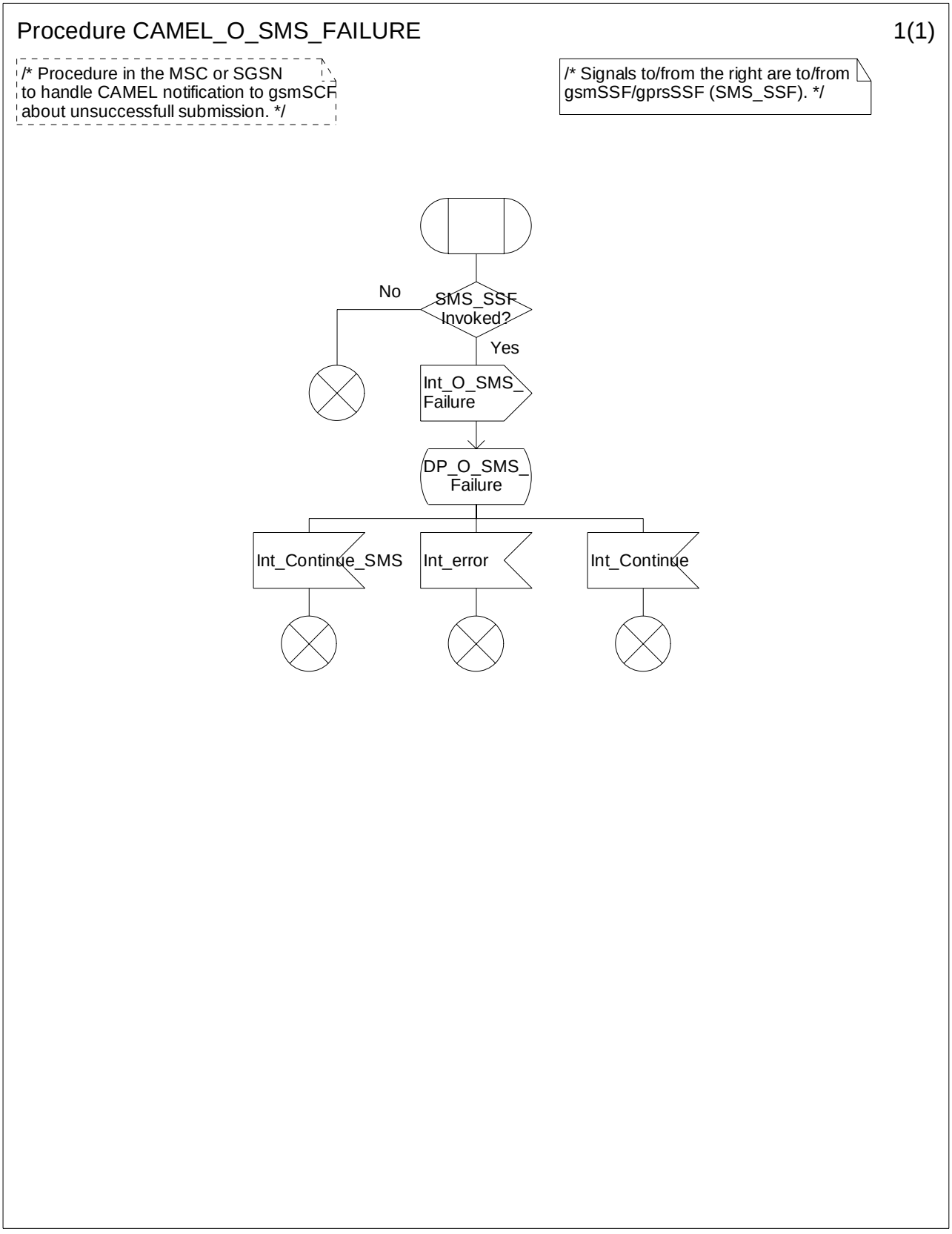


Figure 7.9: Procedure CAMEL_O_SMS_FAILURE (sheet 1)

7.5.2A Handling of mobile originating SMS in the VLR

The functional behaviour of the VLR is specified in 3GPP TS 29.002 [32]. The handling specific to CAMEL is specified in the following procedure:

- Procedure CAMEL_MO_SMS_VLR.

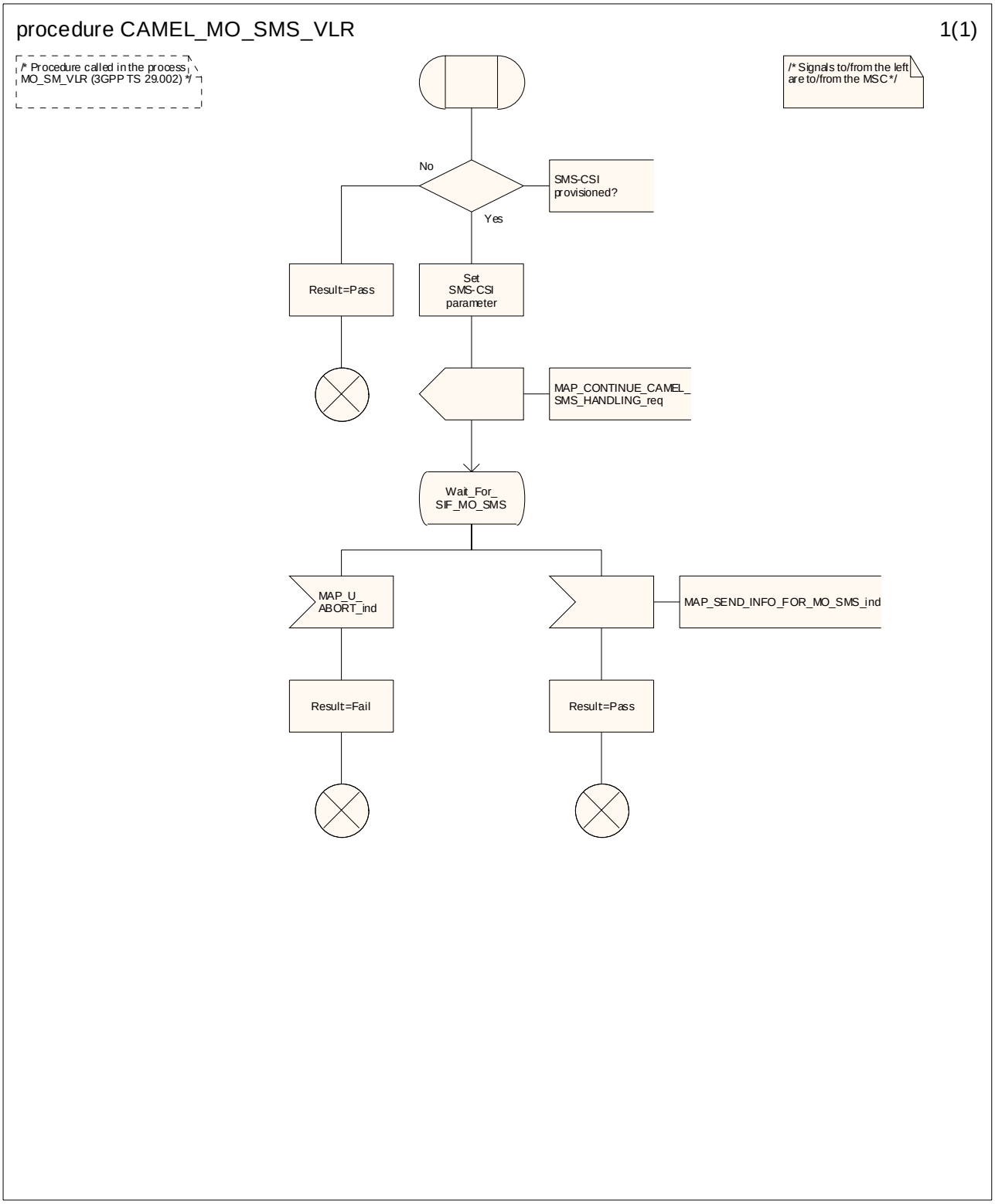


Figure 7.9bis: Procedure CAMEL_MO_SMS_VLR (sheet 1)

7.5.3 Handling of mobile originating SMS in the gsmSSF/gprsSSF

****** End of document ******

3GPP TSG CN WG2 Meeting #28
Dublin, EIRE, 10th – 14th February 2003

N2-030104
(Revision of N2-030053)

CR-Form-v7

CHANGE REQUEST

⌘ **23.078** **CR** **527** ⌘ **rev** **1** ⌘ Current version: **3.15.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone
Work item code:	⌘	CAMEL3
Date:	⌘	11/02/2003
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred. **This is a critical correction**.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This introduces a new procedure, CAMEL_MO_SMS_VLR, which is called from the main process (which is described in TS 29.002 clause 23)
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly.

Clauses affected:	⌘	7.5.2A (new)			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	CR 29.002-542
		X /	Other core specifications		
		/ **X**	Test specifications		
		/ **X**	O&M Specifications		
Other comments:	⌘				

**** First modified section ****

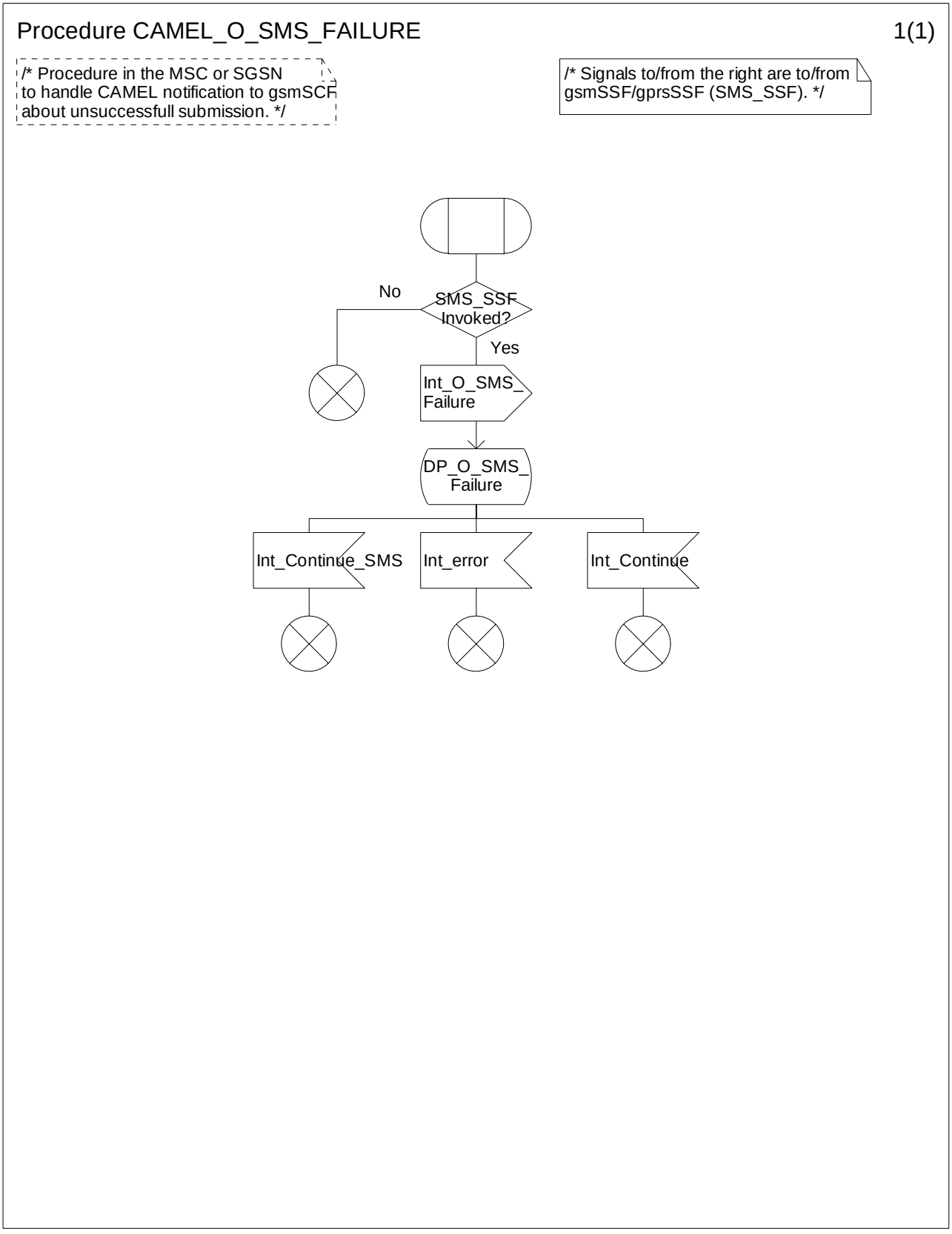


Figure 7.9: Procedure CAMEL_O_SMS_FAILURE (sheet 1)

7.5.2A Handling of mobile originating SMS in the VLR

The functional behaviour of the VLR is specified in 3GPP TS 29.002 [32]. The handling specific to CAMEL is specified in the following procedure:

- Procedure CAMEL_MO_SMS_VLR.

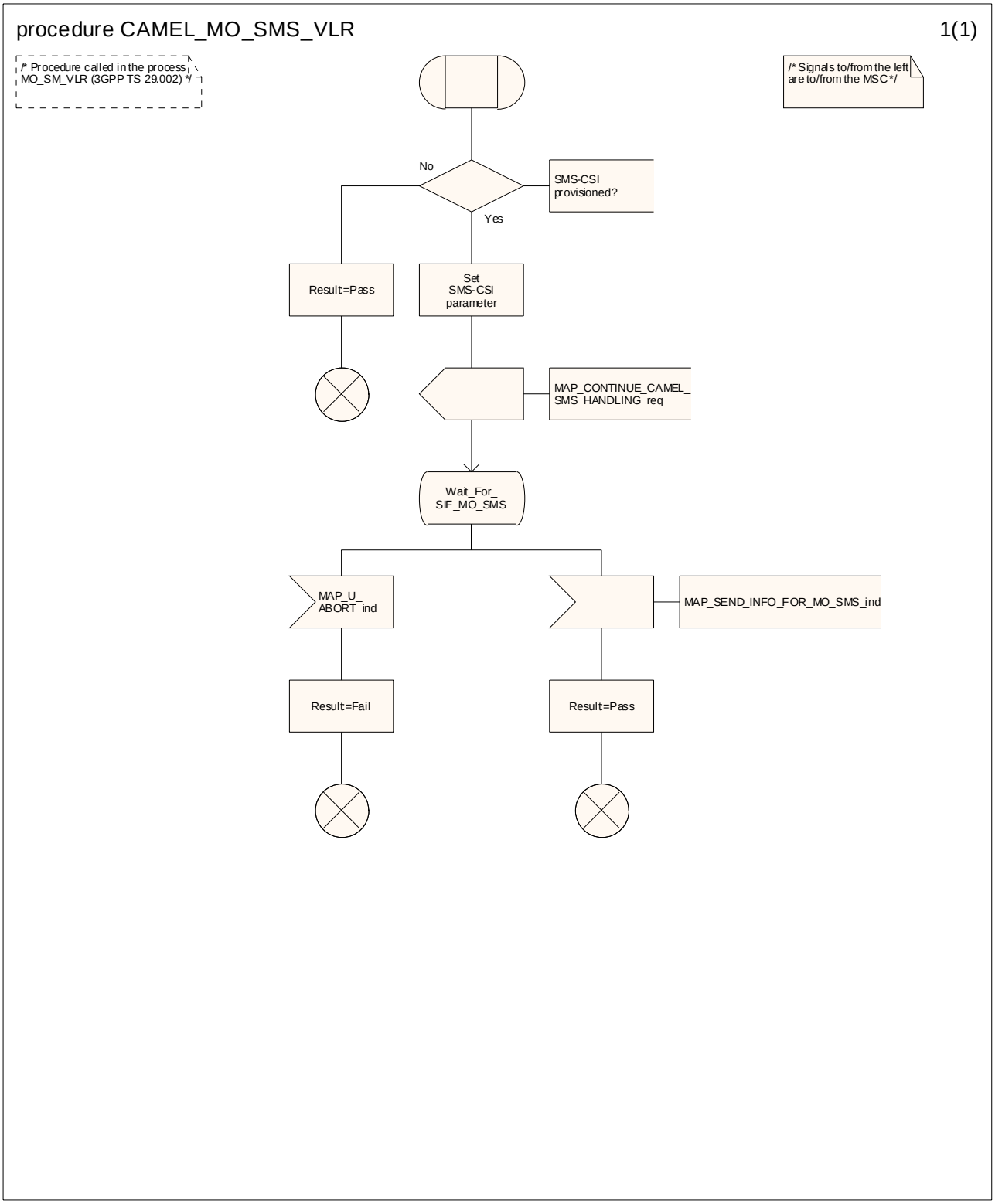


Figure 7.9bis: Procedure CAMEL_MO_SMS_VLR (sheet 1)

7.5.3 Handling of mobile originating SMS in the gsmSSF/gprsSSF

****** End of document ******

3GPP TSG CN Plenary Meeting #19
Birmingham, UK, 12th – 14th March 2003 **(Revision of N4-030326)**

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **542** ⌘ **rev** **3** ⌘ Current version: **3.15.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to interactions between CAMEL control of MO SMS and barring
Source:	⌘	Vodafone, Lucent Technologies, L M Ericsson
Work item code:	⌘	CAMEL3
Date:	⌘	26/02/2003
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The current specification of CAMEL handling of MO SMS shows that the VLR checks whether Operator Determined Barring or SS barring would prevent submission of the short message **before** any CAMEL interaction. The CAMEL handling may modify the Service Centre address for the MO SMS submission, so the barring check may prevent the submission of a short message which should be allowed; conversely, the CAMEL change to the service centre address may lead to the submission of a short message which should be barred. **This is a critical correction**.
Summary of change:	⌘	Change the modelling of the handling of MO SMS to use two VLR interrogations if there is CAMEL handling (in the same way as for an MO CS call). This requires changes to the processes MO_SMS_MSC and MO_SMS_VLR (text and SDL descriptions). Reflect the sequence of checking: BAOC (both ODB and SS in the MSC/VLR, ODB only in the SGSN); CAMEL handling; BOIC/BOIC-exHC (both ODB and SS in the MSC/VLR, ODB only in the SGSN), to reflect the description in 23.078.
Consequences if not approved:	⌘	Barring of MO SMS submission when there is CAMEL handling will not work correctly, which can lead to complaints from subscribers about SMS submission not working when it should, or working (and being charged for) when it should not.

Clauses affected:	⌘	23.2.1, 23.2.2, 23.2.4

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		CR 23.078-527
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	The pretence of MAP dialogues between the MSC and the VLR leads to unnecessary complexity in the SDL diagrams (handling for MAP_NOTICE and MAP_P_ABORT, possibility of protocol version dropback). This has been removed, as a small step in the right direction. A text box has been added to each sheet of SDL which needs it, to state the convention for the source and destination of input and output signals. This has not been highlighted in the SDL diagrams.

**** First modified section ****

23.2.1 Procedure in the servicing MSC

Any CAMEL-specific handling defined in this subclause is omitted if the MSC does not support CAMEL control of MO SMS or if the subscriber does not have a subscription for CAMEL control of MO SMS.

~~The activation of the MAP_PROCESS_ACCESS_REQUEST service is described in the clause 25.4.1.~~

When the MSC receives~~ing~~ the short message from the A-interface, ~~the MSC~~it sends ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS request to the VLR~~. As~~ and waits for a response. While the MSC is waiting for a response from the VLR:

~~- if it receives a Release indication from the A-interface, it aborts the dialogue with the VLR, and the process terminates;~~

- if the VLR aborts, or prematurely closes, the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with error cause "Network out of order" to the MS, and the process terminates;

- if it receives a MAP_CONTINUE_CAMEL_SMS_HANDLING indication, it checks the indication.

  - if the indication is badly formed, the MSC sends an A_RP_ERROR with error cause "Network out of order" to the MS and aborts the dialogue with the VLR, and the process terminates;

  - if the indication is OK, the MSC calls the procedure CAMEL_O_SMS_INIT and tests the result.

    - if the result was "SMS_Aborted", the MSC aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Release_SMS", the MSC returns an A_RP_ERROR, with an error cause as instructed by the gsmSCF, to the MS and aborts the dialogue with the VLR, and the process terminates;

    - if the result was "Redirect SMS", the MSC modifies the data for the submitted short message as instructed by the gsmSCF, sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress O-CSI set~~ and waits for a response;

    - if the result was "Continue", the MSC sends to the VLR a MAP_SEND_INFO_FOR_MO_SMS request ~~with the parameter Suppress O-CSI set~~ and waits for a response. The handling for this request is shown in the procedure CAMEL_MO_SMS_VLR (see 3GPP TS 23.078 [98]).

- if it ~~will~~ receives ~~the~~ a MAP_SEND_INFO_FOR_MO_SMS confirmation from VLR, it checks the confirmation. ~~indicating that:~~

  - if the confirmation includes an error, the MSC reports to the gsmSCF that the short message submission has failed and sends an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

  - if the confirmation indicates a successful result, the MSC checks whether the MSC is also the SMS-IWMSC.

    - if the MSC is separate from the SMS-IWMSC, MSC handling continues as described below under the heading "Serving MSC is separate from SMS-IWMSC".

    - if the MSC is also the SMS-IWMSC, the MSC handling continues as described below under the heading "Serving MSC is SMS-IWMSC";

Serving MSC is separate from SMS-IWMSC

The MSC checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;

  - if the dialogue opening is successful, the MSC waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the two requests cannot be grouped in a single TC message, the MSC requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

  - if the dialogue opening is successful, the MSC sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

  - if the macro Receive_Open_Cnf takes the "Error" exit, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

  - if the macro Receive_Open_Cnf takes the "Vr" exit, the MSC handles the dialogue according to the specification for the earlier version of the protocol, and checks the result.

    - if the submission was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

    - if the submission failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates.~~;~~

  ~~- if the macro Receive_Open_Cnf takes the "Error" exit, the MSC returns an A_RP_ERROR with cause "Network out of order" to the MS and reports to the gsmSCF that the short message submission has failed, and the process terminates.~~

- if the MSC receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the MSC reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates;

  - if the confirmation indicates that the submission of the short message failed, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

~~- if the MSC receives a Release indication from the A-interface, it aborts the dialogue with the SMS-IWMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the dialogue with the SMS-IWMSC fails, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates.

Serving MSC is SMS-IWMSC

The MSC sends an SC_RP_MO_DATA request to the Short Message Service Centre (SMSC), and waits for the response.

~~- if the MSC receives a Release indication from the A-interface, it aborts the dialogue with the SMSC and reports to the gsmSCF that the short message submission has failed, and the process terminates;~~

- if the MSC receives an error response from the SMSC, it reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with the appropriate error cause to the MS, and the process terminates;

- if the SMSC aborts the dialogue, the MSC reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process terminates;

- if the MSC receives a positive response from the SMSC, it reports to the gsmSCF that the short message submission was successful and returns an A_RP_ACK to the MS, and the process terminates.

~~- the service ends successfully. If the MSC is not itself the IWMSC, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request;~~

~~- the service ends unsuccessfully. The error cause in the MAP_SEND_INFO_FOR_MO_SMS confirmation indicates the reason for the unsuccessful end. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26].~~

~~If there are data errors in the MAP_SEND_INFO_FOR_MO_SMS confirmation, or there is an operation failure in MAP, the RP_ERROR cause network out of order is forwarded to the mobile station.~~

~~The MSC opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS.~~

~~The MSC checks the barring as follows;~~

~~- if the short message transfer would contravene operator determined barring, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause operator barring is returned to MS;~~

~~- if the short message transfer would contravene the supplementary service call barring conditions, the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the call barred error with cause barring service active is returned to MS.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the MSC will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation. If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing MSC will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

~~- the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

~~- one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in the SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

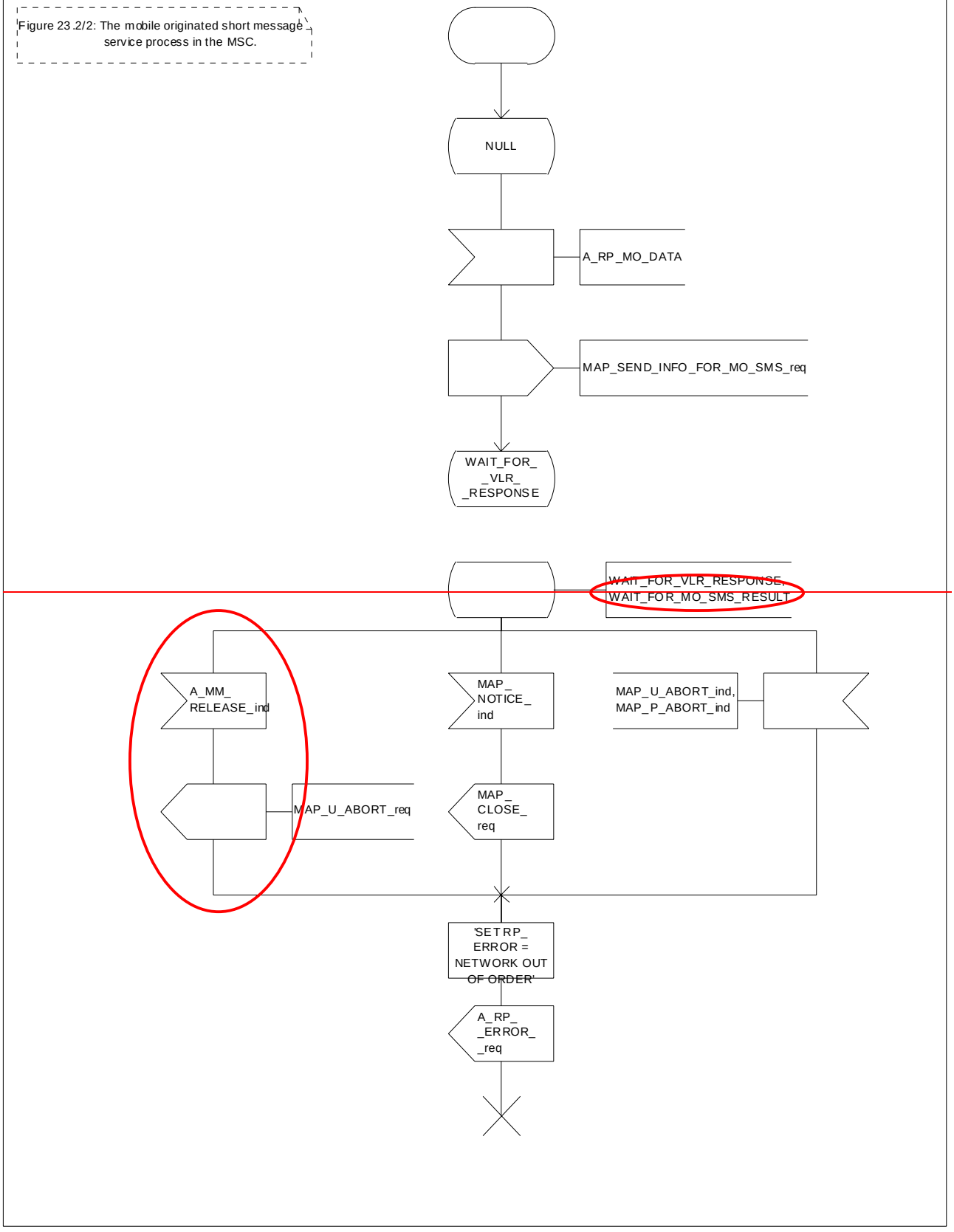
~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

~~If the MSC itself is the interworking MSC, the short message is forwarded to the Service Centre. In that case the service MAP_MO_FORWARD_SHORT_MESSAGE is not initiated. The acknowledgement message from the Service Centre is forwarded to the mobile station (3GPP TS 23.040[26], 3GPP TS 24.011 [37]).~~

The mobile originated short message service proces~~sdure~~ in the MSC is shown in figure 23.2/2.

Process MOSM_MSC 23.2_2.1(3)

Figure 23.2/2: The mobile originated short message service process in the MSC.



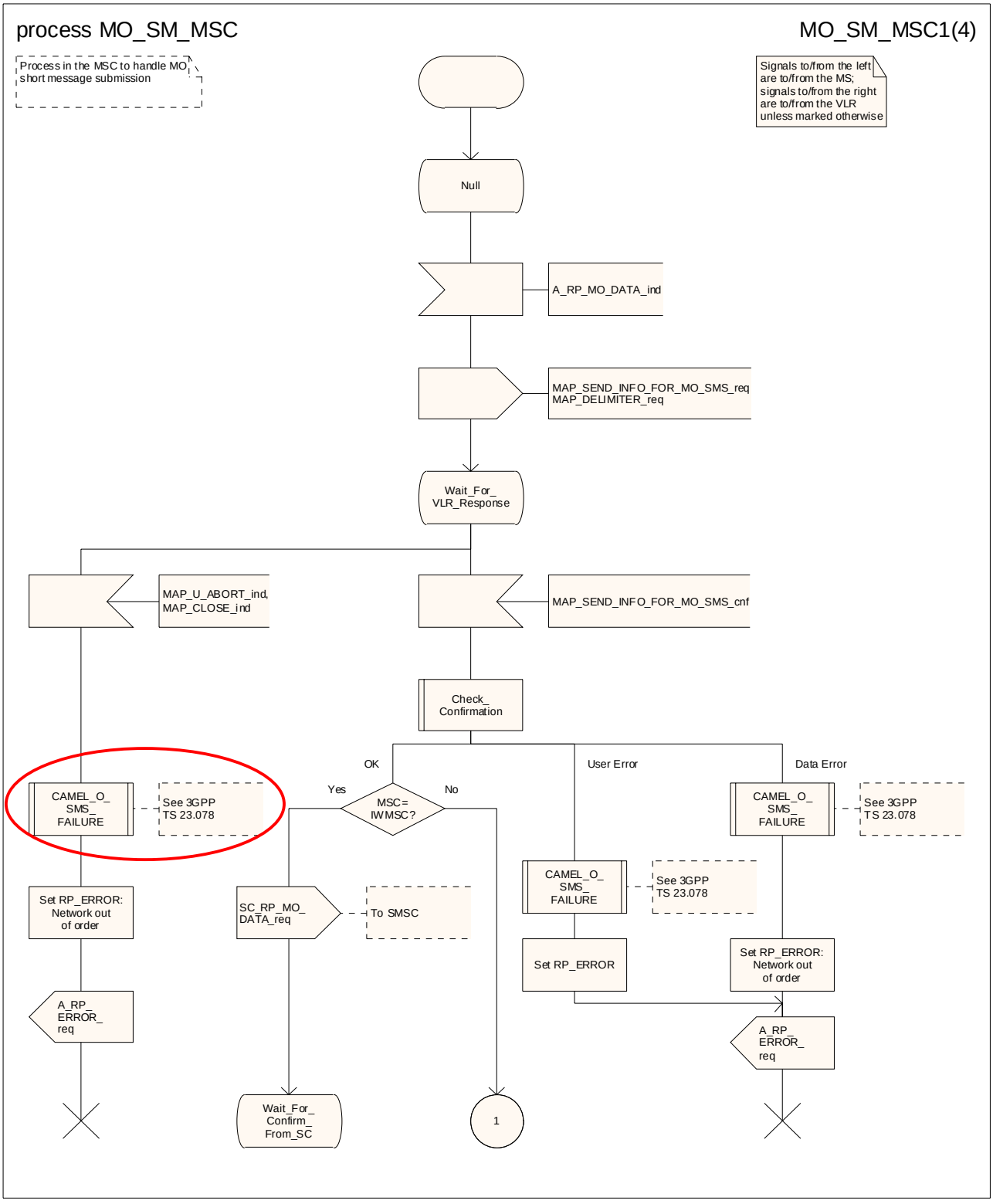
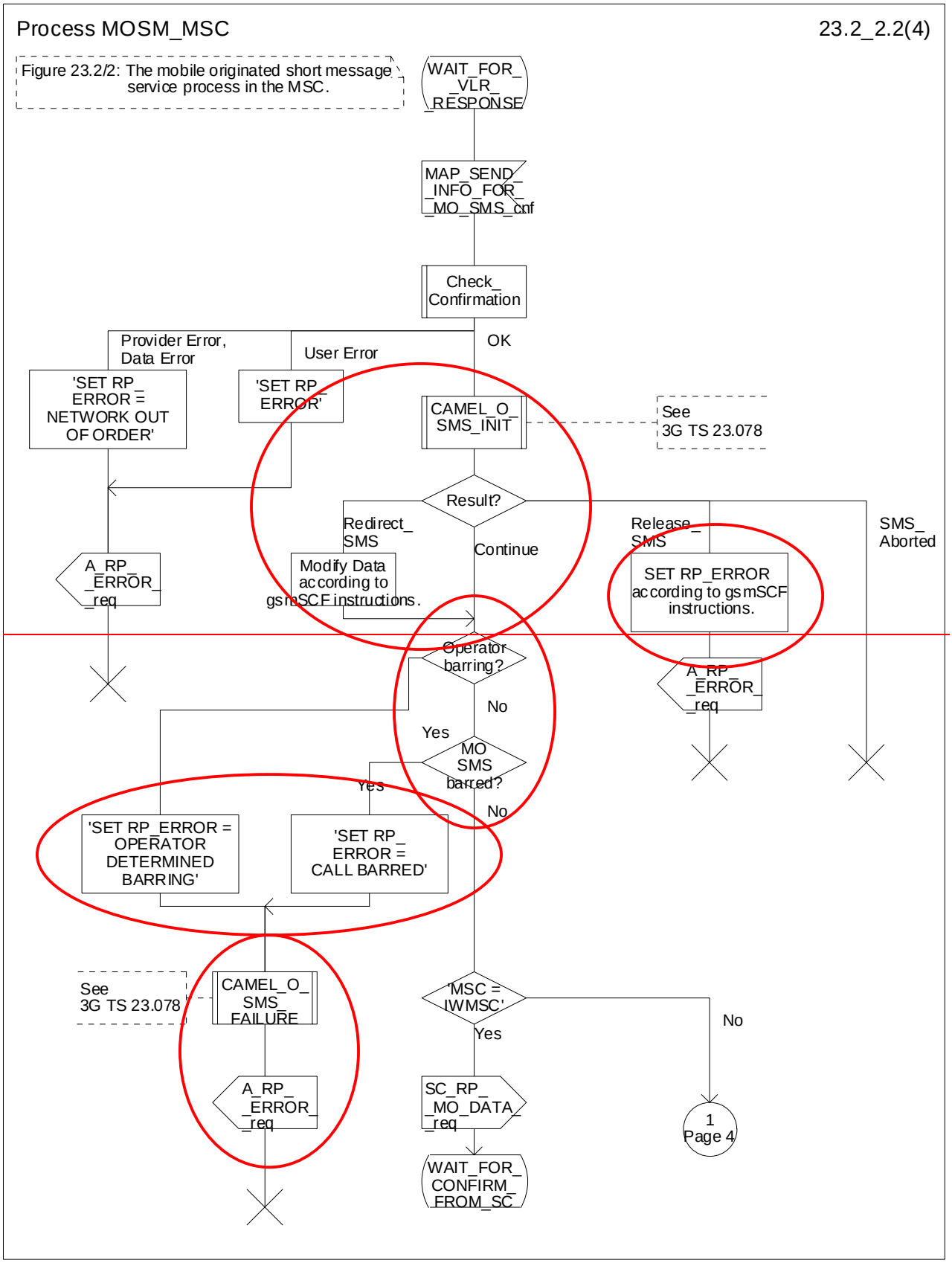


Figure 23.2/2 (sheet 1 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.2(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
WAIT_FOR_VLR_RESPONSE
MAP_SEND_INFO_FOR_MO_SMS_cnf
Check_Confirmation
Provider Error, Data Error
User Error
OK
'SET RP_ERROR = NETWORK OUT OF ORDER'
'SET RP_ERROR'
CAMEL_O_SMS_INIT
See 3G TS 23.078
Result?
Redirect_SMS
Continue
Release_SMS
SMS_Aborted
A_RP_ERROR_req
Modify Data according to gsmSCF instructions.
SET RP_ERROR according to gsmSCF instructions.
Operator barring?
No
Yes
MO SMS barred?
Yes
No
'SET RP_ERROR = OPERATOR DETERMINED BARRING'
'SET RP_ERROR = CALL BARRED'
See 3G TS 23.078
CAMEL_O_SMS_FAILURE
'MSC = IWMSC'
No
Yes
A_RP_ERROR_req
SC_RP_MO_DATA_req
1 Page 4
WAIT_FOR_CONFIRM_FROM_SC

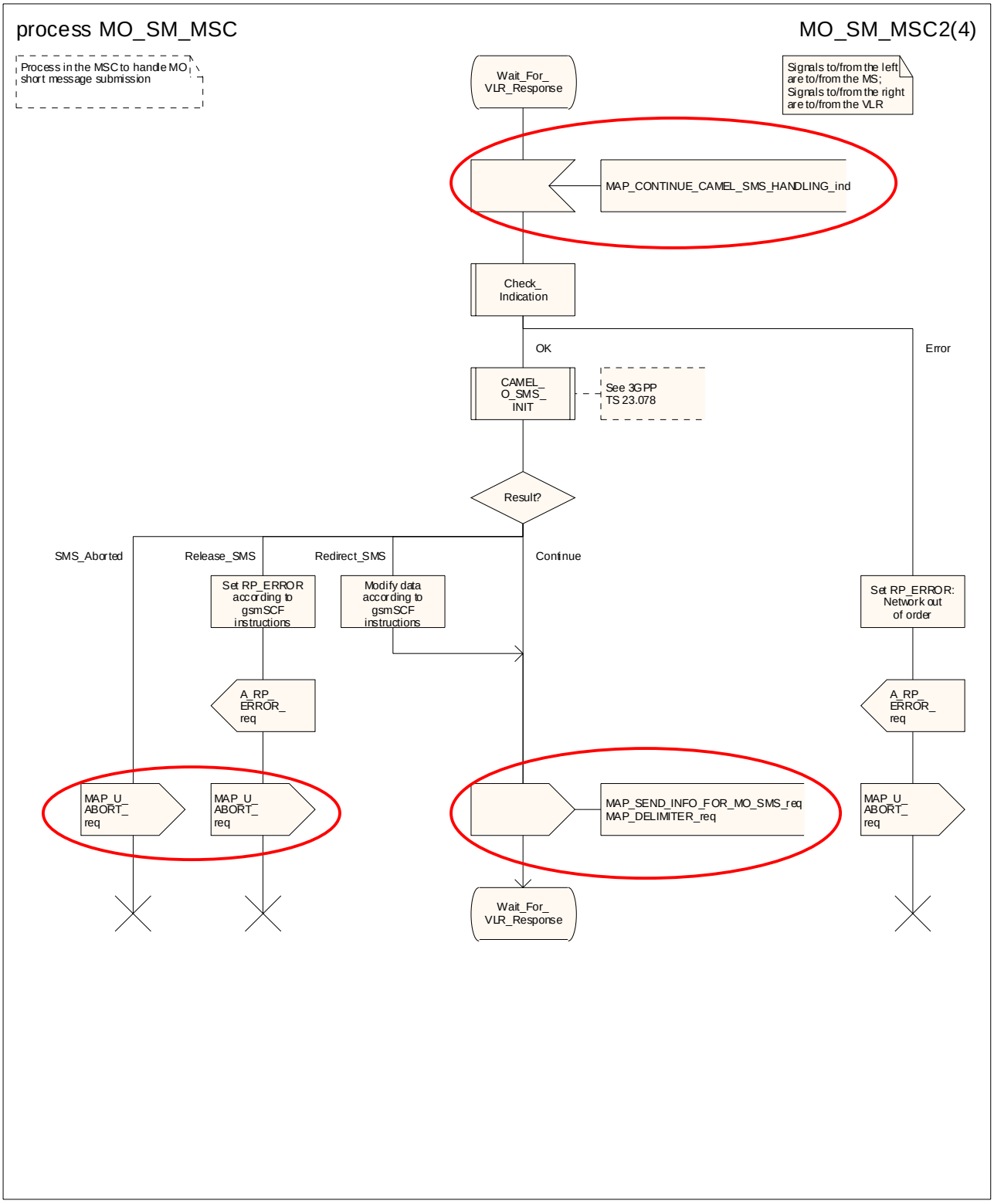
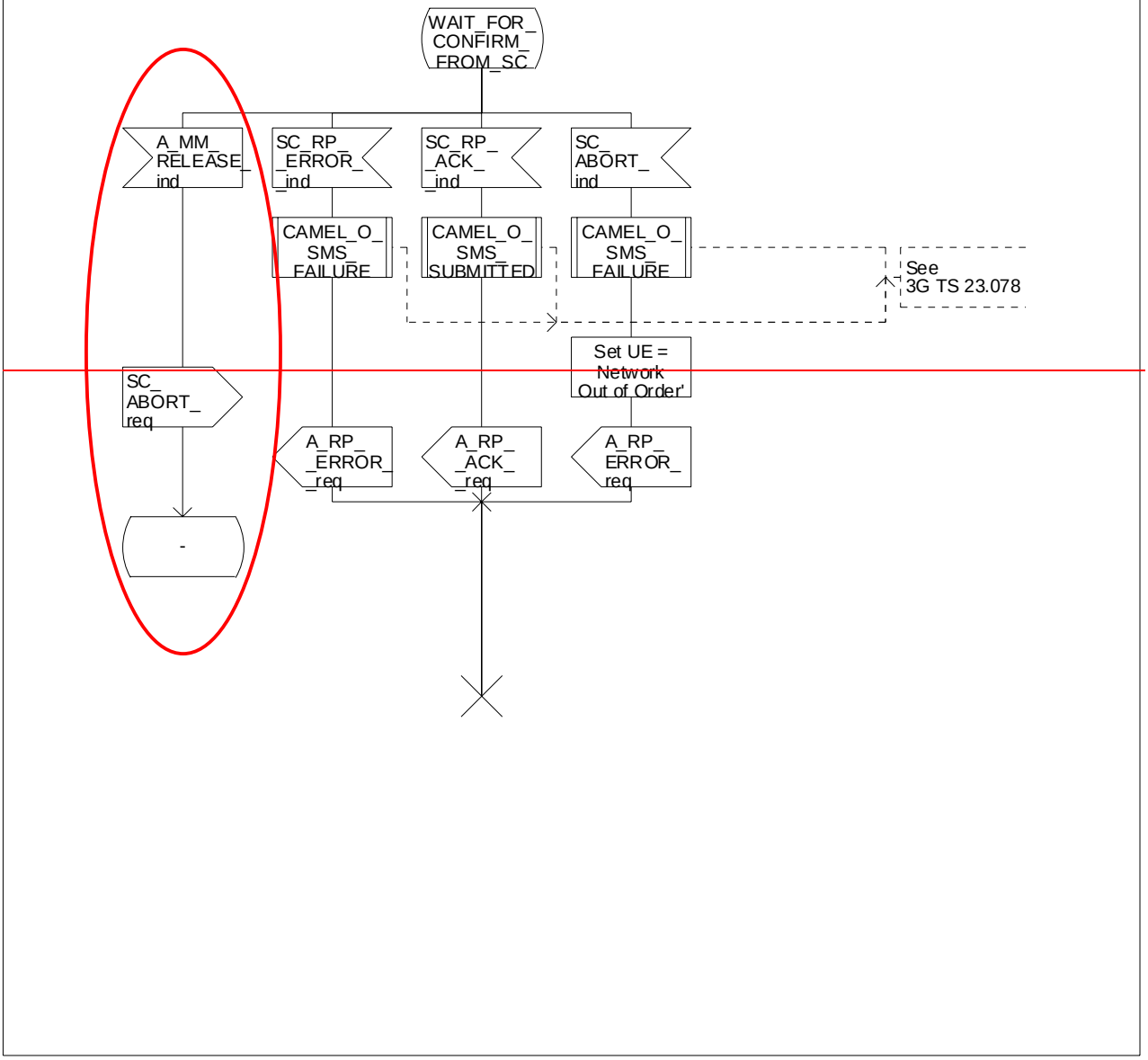


Figure 23.2/2 (sheet 2 of 4): Process MO_SM_MSC

Process MOSM_MSC 23.2_2.new3(4)

Figure 23.2/2: The mobile originated short message service process in the MSC.



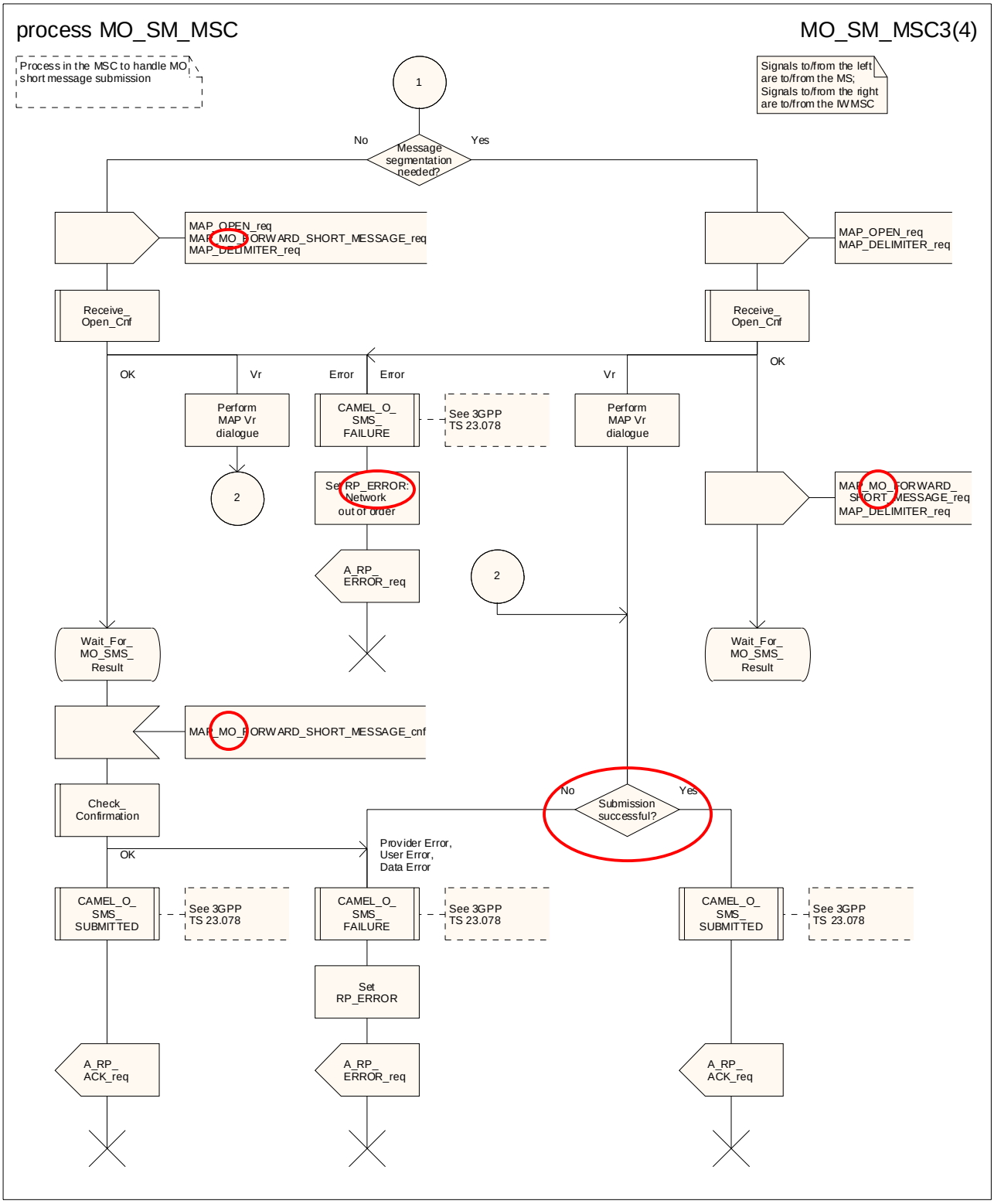
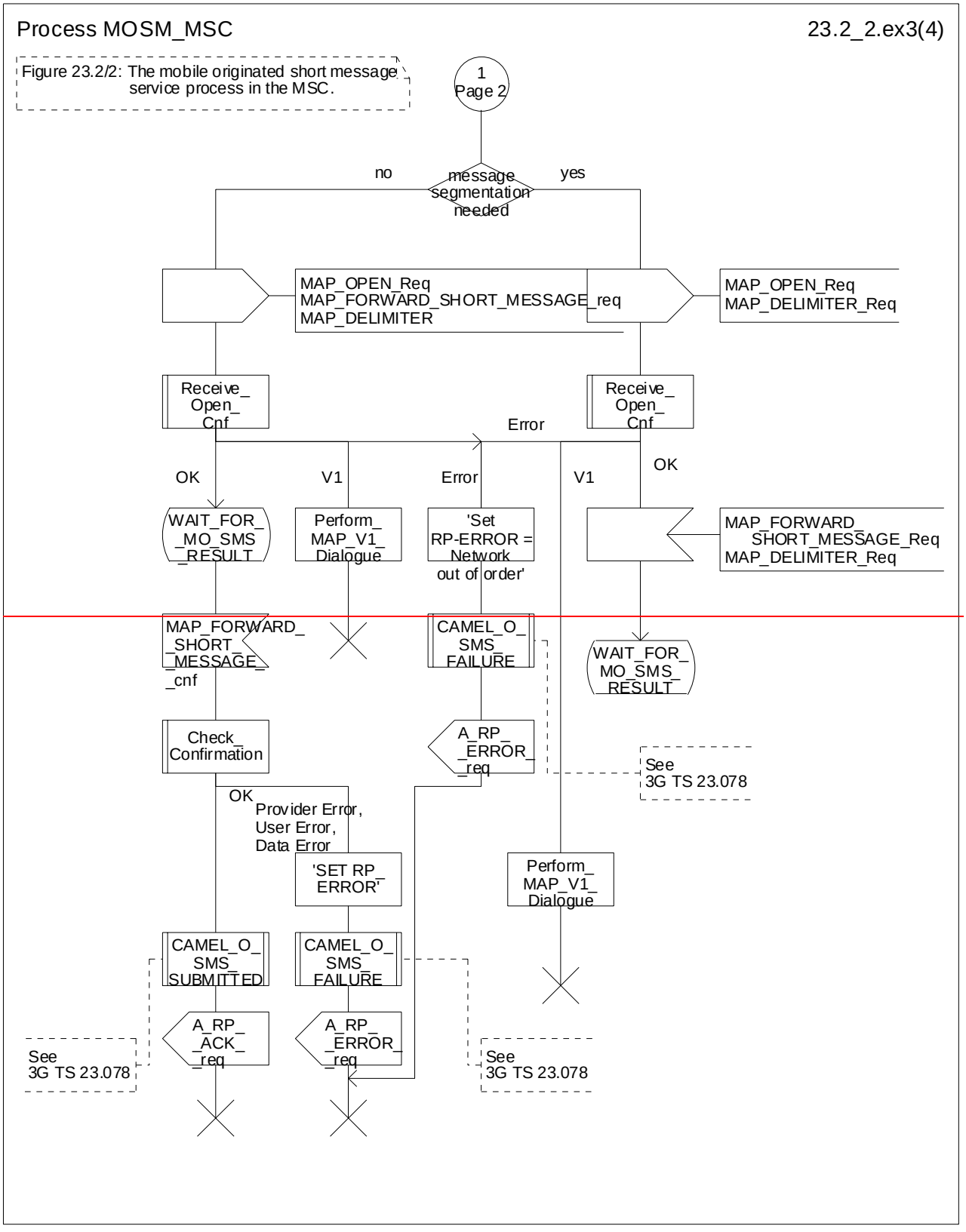


Figure 23.2/2 (sheet 3 of 4): Process MO_SM_MSC


Process MOSM_MSC
23.2_2.ex3(4)
Figure 23.2/2: The mobile originated short message service process in the MSC.
1
Page 2
no
message segmentation needed
yes
MAP_OPEN_Req
MAP_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
V1
Error
V1
OK
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_V1_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_FORWARD_ _SHORT_ _MESSAGE_ _cnf
CAMEL_O_ SMS_ FAILURE
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
A_RP_ _ERROR_ _req
See 3G TS 23.078
OK
Provider Error, User Error, Data Error
'SET RP_ ERROR'
Perform_ MAP_V1_ Dialogue
CAMEL_O_ SMS_ SUBMITTED
CAMEL_O_ SMS_ FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req
See 3G TS 23.078
See 3G TS 23.078

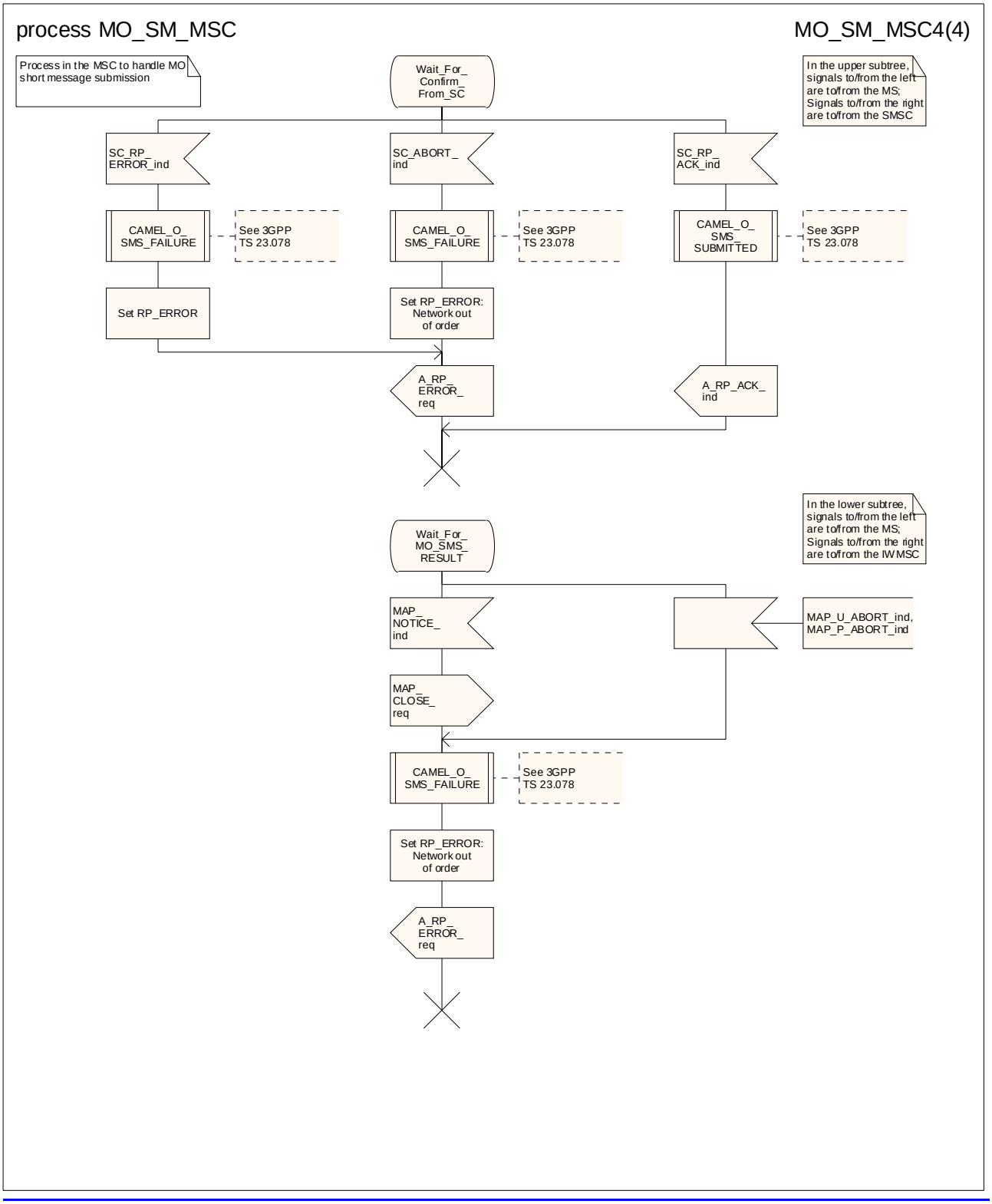


Figure 23.2/2 (sheet 4 of 4): Process MO_SM_MSC

23.2.2 Procedure in the VLR

Any CAMEL-specific handling defined in this subclause is omitted if the VLR does not support CAMEL control of MO SMS.

The process is triggered by a dialogue opening request followed by a MAP_PROCESS_ACCESS_REQUEST including a CM service type Short Message Service.

If the macro Process_Access_Request_VLR takes the "OK" exit, the VLR waits for a MAP_SEND_INFO_FOR_MO_SMS indication from the MSC.

- If the MSC aborts the dialogue, the process returns to the Null state;
- if the indication is badly formed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the appropriate user error;
- if the indication is OK, the VLR checks whether the submission of the short message is allowed
  - if MO SMS is not provisioned, VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Teleservice not provisioned";
  - if the submission of the short message is prevented by Operator Determined Barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by supplementary service barring of all outgoing calls, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - the VLR calls the procedure CAMEL_MO_SMS_VLR and checks the result.
    - if the result is "Fail", the process returns to the Null state;
    - if the result is "Pass", the VLR continues to check the subscription information.
  - if the submission of the short message is prevented by Operator Determined Barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Operator barring";
  - if the submission of the short message is prevented by ~~the Barring~~ supplementary service barring (other than barring of all outgoing calls), the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the user error "Call barred" with barring cause "Barring service active";
  - if the submission of the short message is allowed, the VLR returns a MAP_SEND_INFO_FOR_MO_SMS response containing the MSISDN of the requesting subscriber..

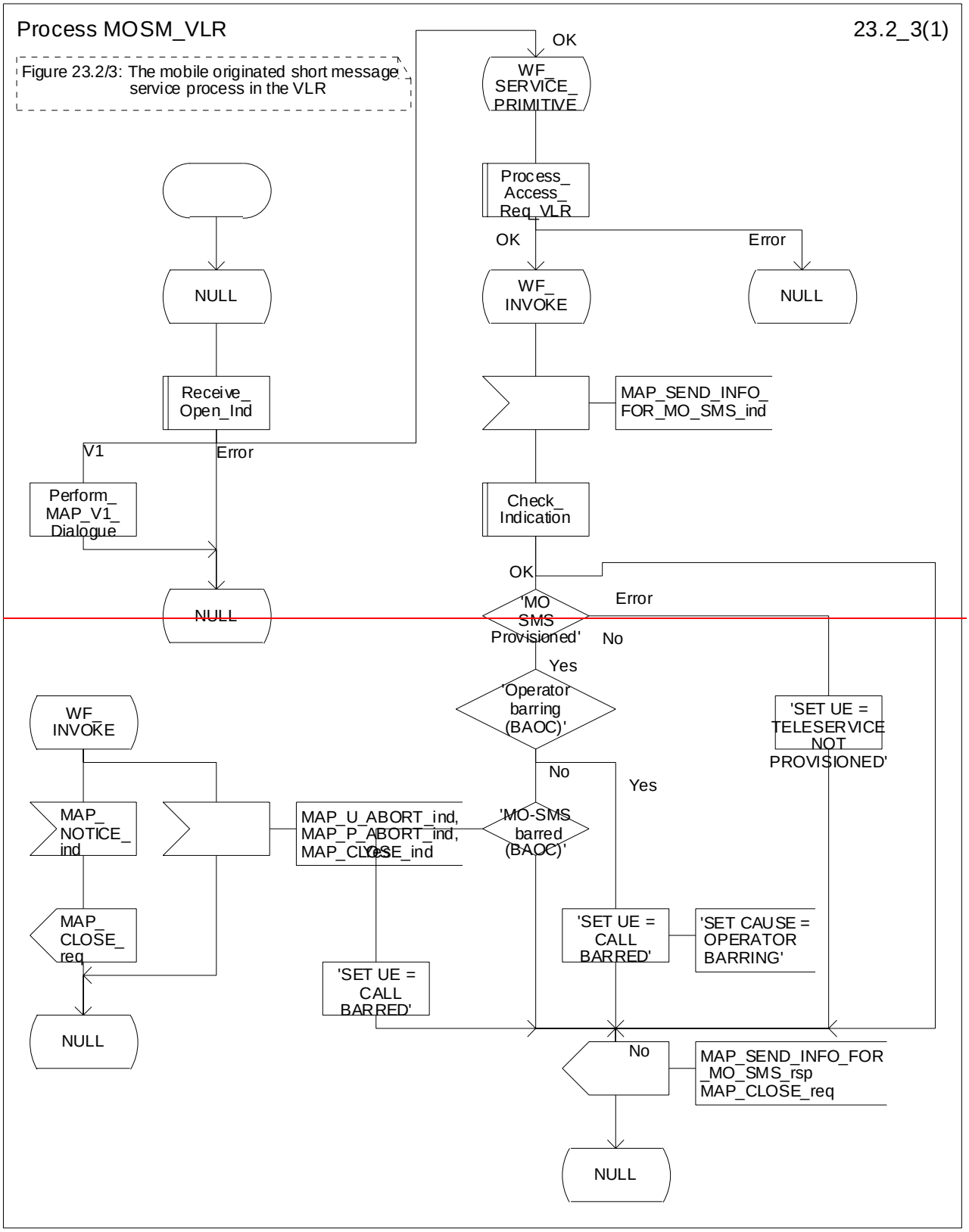
When the VLR has returned the MAP_SEND_INFO_FOR_MO_SMS response, the process returns to the Null state.

~~The MAP_PROCESS_ACCESS_REQUEST indication starts the MAP_PROCESS_ACCESS_REQUEST service in the VLR. The application context in the MAP_OPEN indication is mobile originated short message transfer.~~

~~If the service MAP_PROCESS_ACCESS_REQUEST is successful, the VLR waits for the next message from the MSC. When receiving the MAP_SEND_INFO_FOR_MO_SMS indication, the VLR acts as follows:~~

- ~~if there is incompatibility in the subscription check, the error teleservice not provisioned is returned to the MSC;~~
- ~~if the short message transfer would contravene Operator determined Barring (BAOC), the call barred error with cause operator barring is returned;~~
- ~~if the short message transfer would contravene the supplementary service call barring conditions (BAOC)in the VLR, the call barred error with cause barring service active is returned.~~

~~When the mobile subscriber has passed all checks, the MAP_SEND_INFO_FOR_MO_SMS response is initiated and the procedure is terminated in the VLR.~~ The mobile originated short message transfer process~~dure~~ in the VLR is shown in figure 23.2/3.


Process MOSM_VLR
23.2_3(1)
Figure 23.2/3: The mobile originated short message service process in the VLR
OK
WF_ SERVICE_ PRIMITIVE
Process_ Access_ Req_VLR
OK
Error
NULL
WF_ INVOKE
NULL
Receive_ Open_Ind
MAP_SEND_INFO_ FOR_MO_SMS_ind
V1
Error
Perform_ MAP_V1_ Dialogue
Check_ Indication
OK
NULL
'MO SMS Provisioned'
Error
No
Yes
'Operator barring (BAOC)'
WF_ INVOKE
'SET UE = TELESERVICE NOT PROVISIONED'
No
Yes
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind, MAP_CLOSE_ind
'MO-SMS barred (BAOC)'
MAP_ CLOSE_ req
'SET UE = CALL BARRED'
'SET UE = CALL BARRED'
'SET CAUSE = OPERATOR BARRING'
NULL
No
MAP_SEND_INFO_FOR _MO_SMS_rsp MAP_CLOSE_req
NULL

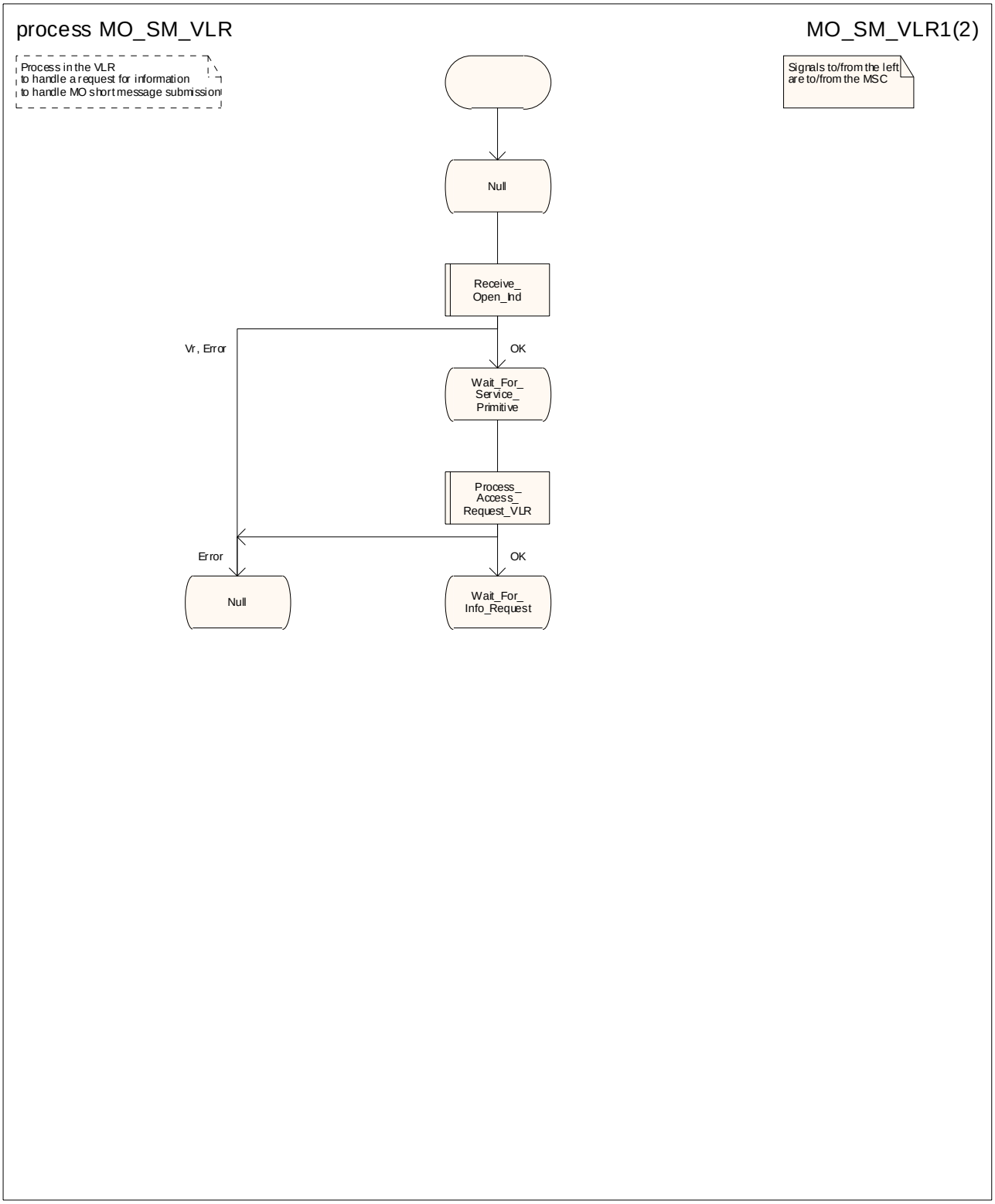


Figure 23.2/3(sheet 1 of 2): Process MO_SM_VLR

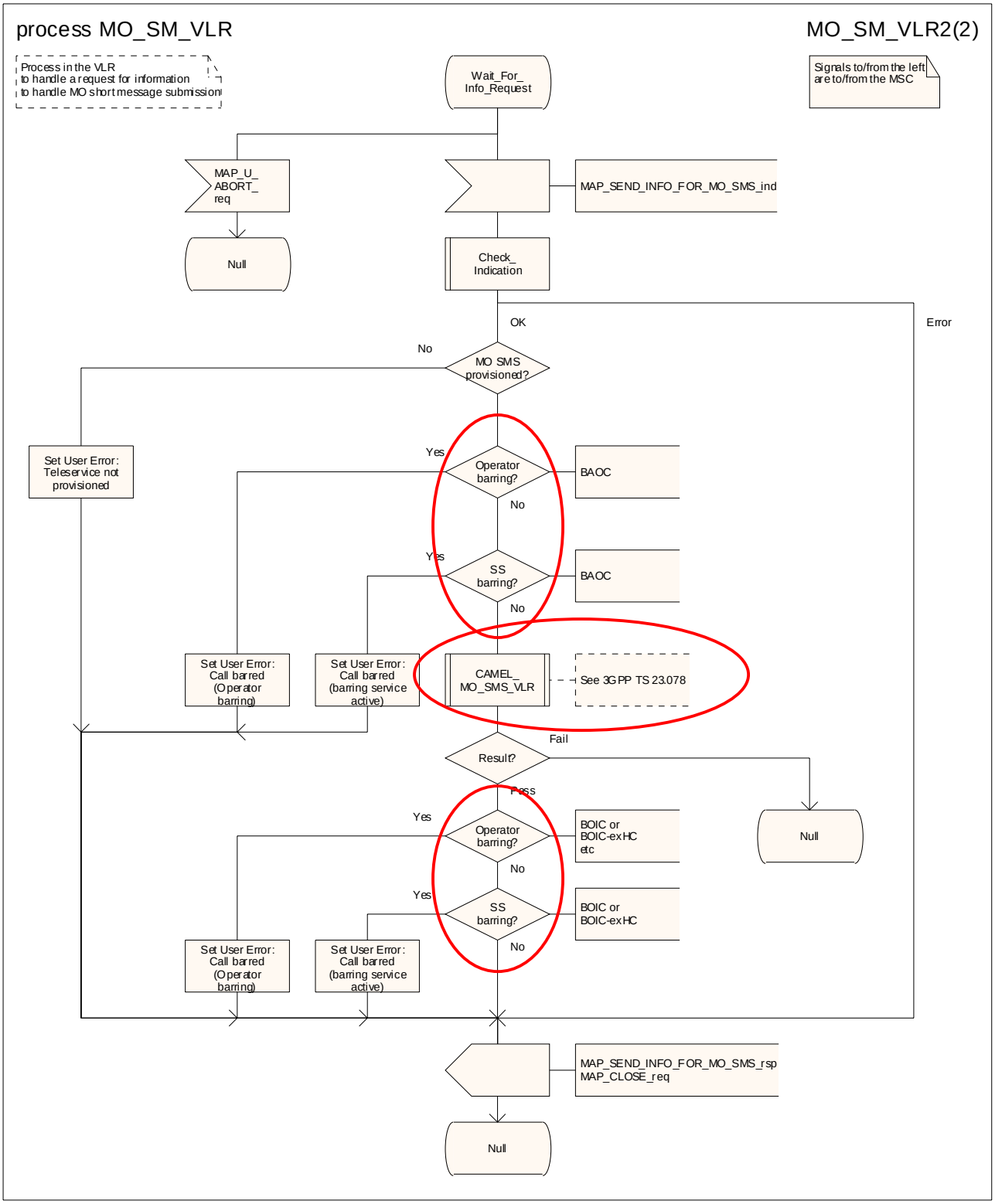


Figure 23.2/3(sheet 2 of 2): Process MO_SM_VLR

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

23.2.4 Procedure in the ~~servicing~~ SGSN

Any CAMEL-specific handling defined in this subclause is omitted if the SGSN does not support CAMEL control of MO SMS, or if the subscriber is not a CAMEL subscriber.

The process is triggered by a short message received from the MS over the Gb interface.

If the MO SMS service is not provisioned, the SGSN returns a Gb_RP_ERROR with error cause "Requested facility not subscribed", and the process returns to the Null state.

If the MO SMS service is provisioned, the SGSN checks whether Operator Determined Barring of all outgoing calls is in force.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN calls the procedure CAMEL_O_SMS_INIT and tests the result.

- if the result was "SMS_Aborted", the process returns to the Null state;
- if the result was "Release_SMS", the SGSN returns a Gb_RP_ERROR, with an error cause as instructed by the gsmSCF, to the MS, and the process returns to the Null state;
- if the result was "Redirect_SMS", the SGSN modifies the data for the submitted short message as instructed by the gsmSCF, and the MSC handling continues;
- if the result was "Continue", the SGSN handling continues.

The SGSN checks whether Operator Determined Barring of outgoing calls (other than barring of all outgoing calls) would prevent the submission of the short message.

- if Operator Determined Barring would prevent the submission of the short message, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with error cause "Operator determined barring" to the MS, and the process returns to the Null state;
- if Operator Determined Barring would not prevent the submission of the short message, the SGSN handling continues.

The SGSN checks whether the MAP_OPEN request and the MAP_MO_FORWARD_SHORT_MESSAGE request can be sent in a single message signal unit through the lower layers of the protocol.

- if the two requests can be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, including the MAP_MO_FORWARD_SHORT_MESSAGE request;
  - if the dialogue opening is successful, the SGSN waits for the response from the SMS-IWMSC;
  - if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.
  - if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.
    - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;
    - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.
- if the two requests cannot be grouped in a single TC message, the SGSN requests a dialogue with the SMS-IWMSC, omitting the MAP_MO_FORWARD_SHORT_MESSAGE request;

- if the dialogue opening is successful, the SGSN sends a MAP_MO_FORWARD_SHORT_MESSAGE request to the SMS-IWMSC, and waits for the response from the SMS-IWMSC;

- if the macro Receive_Open_Cnf takes the "Error" exit, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

- if the macro Receive_Open_Cnf takes the "Vr" exit, the SGSN handles the dialogue according to the specification for the earlier version of the protocol and checks the result.

  - if the submission was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the submission failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state.

- if the SGSN receives a MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the SMS-IWMSC, it checks the content of the confirmation;

  - if the confirmation indicates that the submission of the short message was successful, the SGSN reports to the gsmSCF that the short message submission was successful and returns a Gb_RP_ACK to the MS, and the process returns to the Null state;

  - if the confirmation indicates that the submission of the short message failed, the SGSN reports to the gsmSCF that the short message submission has failed and returns a Gb_RP_ERROR with the appropriate error cause to the MS, and the process returns to the Null state;

- if the dialogue with the SMS-IWMSC fails, the SGSN reports to the gsmSCF that the short message submission has failed and returns an A_RP_ERROR with cause "Network out of order" to the MS, and the process returns to the Null state.

~~When receiving the short message from the MS, the SGSN acts as follows:~~

- ~~if there is incompatibility in the subscription check, the RP_ERROR cause requested facility not subscribed is provided to the mobile station;~~

- ~~the SGSN opens a CAMEL dialogue as specified in 3GPP TS 23.078. If the CAMEL service bars the MO SM then the failure is reported to MS;~~

- ~~if the short message transfer would contravene operator determined barring, , the failure is reported to the CAMEL service as specified in 3GPP TS 23.078 and the RP_ERROR cause operator determined barring is provided to the mobile station;~~

~~NOTE: The RP_ERROR causes are described in 3GPP TS 24.011 [37].~~

- ~~if no error is detected, the short message transmission towards the IWMSC is initiated using the MAP_MO_FORWARD_SHORT_MESSAGE request.~~

~~If the service MAP_MO_FORWARD_SHORT_MESSAGE is started, the SGSN will check whether the grouping of MAP_OPEN request and MAP_MO_FORWARD_SHORT_MESSAGE request needs segmentation.~~

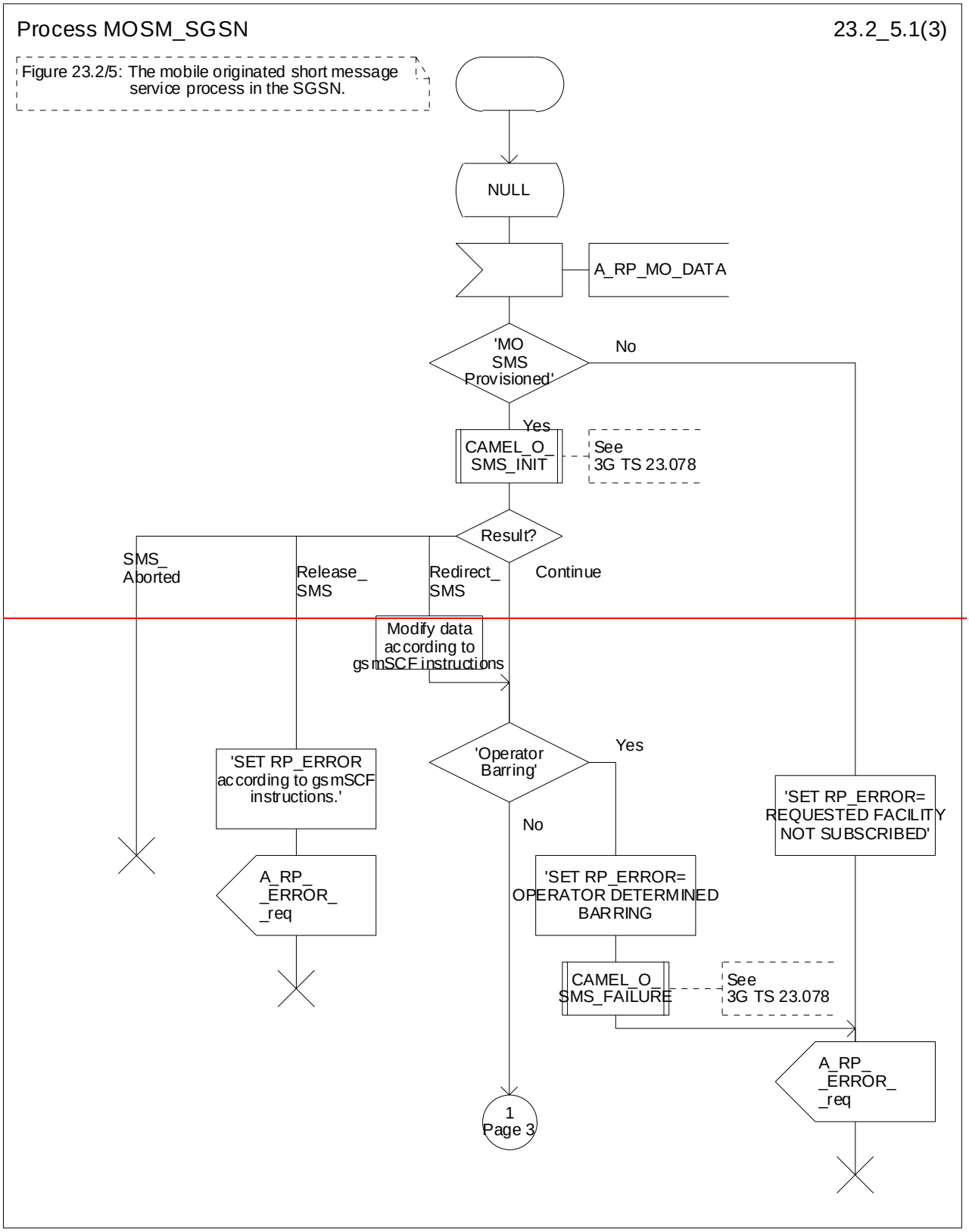
~~If this is the case then the MAP_OPEN request primitive shall be sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MO_FORWARD_SHORT_MESSAGE request is sent. As a response to the procedure, the servicing SGSN will receive the MAP_MO_FORWARD_SHORT_MESSAGE confirmation from the IWMSC indicating that:~~

- ~~the short message has been successfully delivered to the Service Centre. The successful submission of SM is reported to the CAMEL service as specified in 3GPP TS 23.078 and the acknowledgement is sent to the mobile station;~~

- ~~one of several error cases has occurred. The mapping between MAP error causes and RP_ERROR causes is described in 3GPP TS 23.040[26]. The failure in SM submission is reported to the CAMEL service as specified in 3GPP TS 23.078 and the appropriate indication is provided to the mobile station.~~

~~If the procedure failed, a provider error or an abort indication is received. The RP_ERROR cause network out of order is provided to the mobile station.~~

The mobile originated short message service proces~~sdure~~ in the SGSN is shown in figure 23.2/5.


Process MOSM_SGSN
23.2_5.1(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
NULL
A_RP_MO_DATA
'MO SMS Provisioned'
No
Yes
CAMEL_O_ SMS_INIT
See 3G TS 23.078
Result?
SMS_ Aborted
Release_ SMS
Redirect_ SMS
Continue
Modify data according to gsmSCF instructions
'Operator Barring'
Yes
No
'SET RP_ERROR according to gsmSCF instructions.'
'SET RP_ERROR= REQUESTED FACILITY NOT SUBSCRIBED'
A_RP_ _ERROR_ _req
'SET RP_ERROR= OPERATOR DETERMINED BARRING
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
A_RP_ _ERROR_ _req
1 Page 3

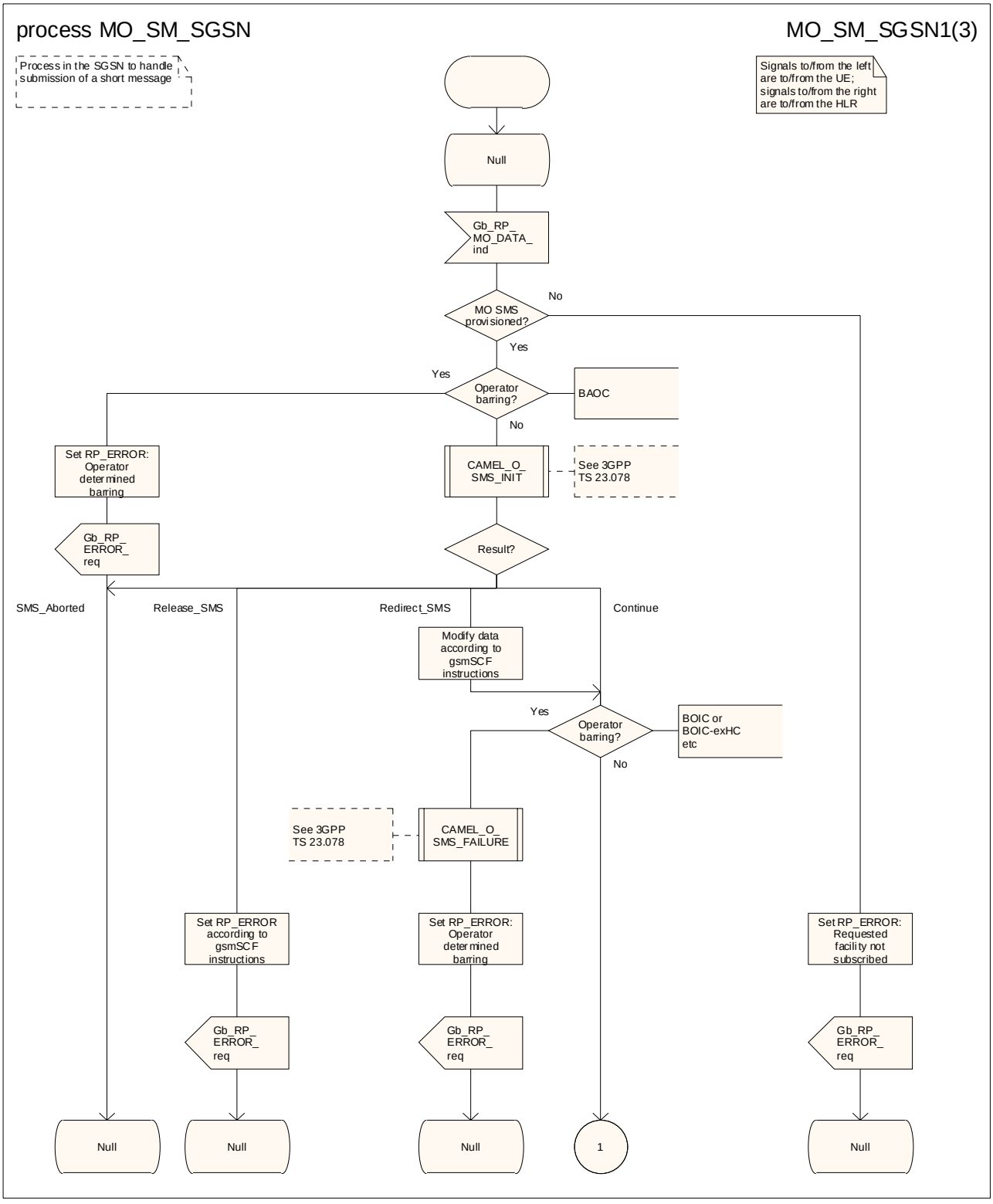
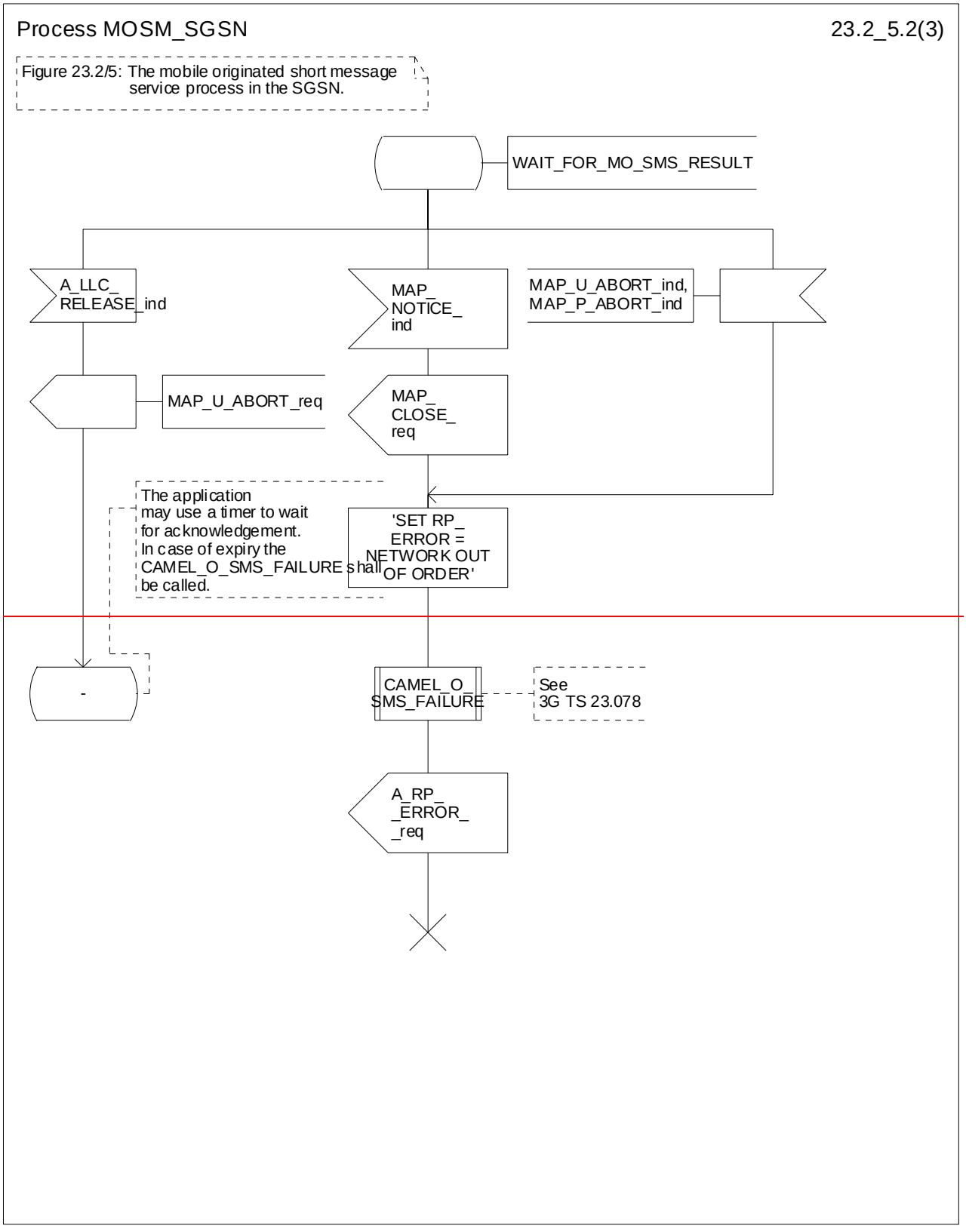


Figure 23.2/5 (sheet 1 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.2(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
WAIT_FOR_MO_SMS_RESULT
A_LLC_ RELEASE_ind
MAP_ NOTICE_ ind
MAP_U_ABORT_ind, MAP_P_ABORT_ind
MAP_U_ABORT_req
MAP_ CLOSE_ req
The application may use a timer to wait for acknowledgement. In case of expiry the CAMEL_O_SMS_FAILURE shall be called.
'SET RP_ ERROR = NETWORK OUT OF ORDER'
-
CAMEL_O_ SMS_FAILURE
See 3G TS 23.078
A_RP_ _ERROR_ _req

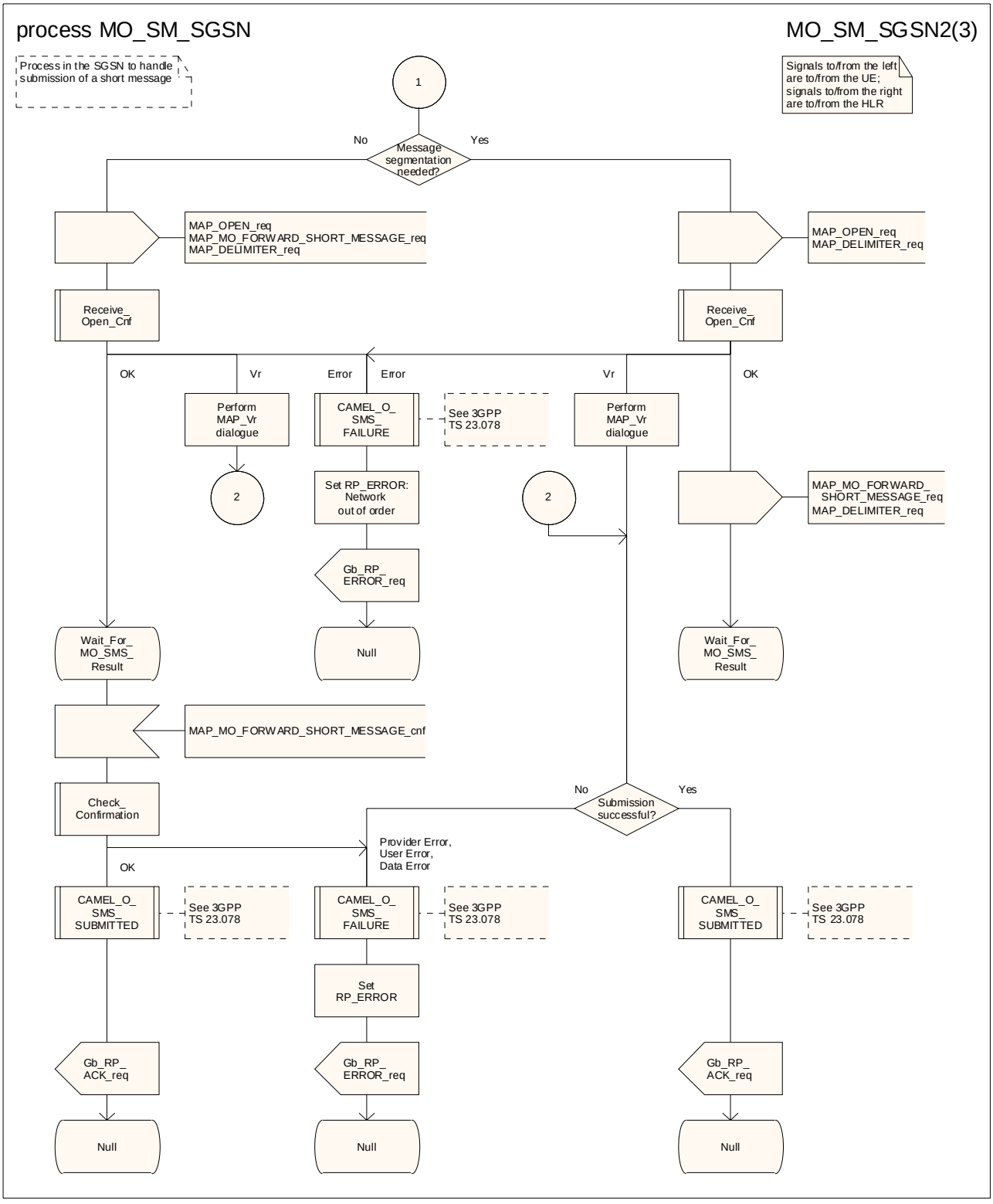
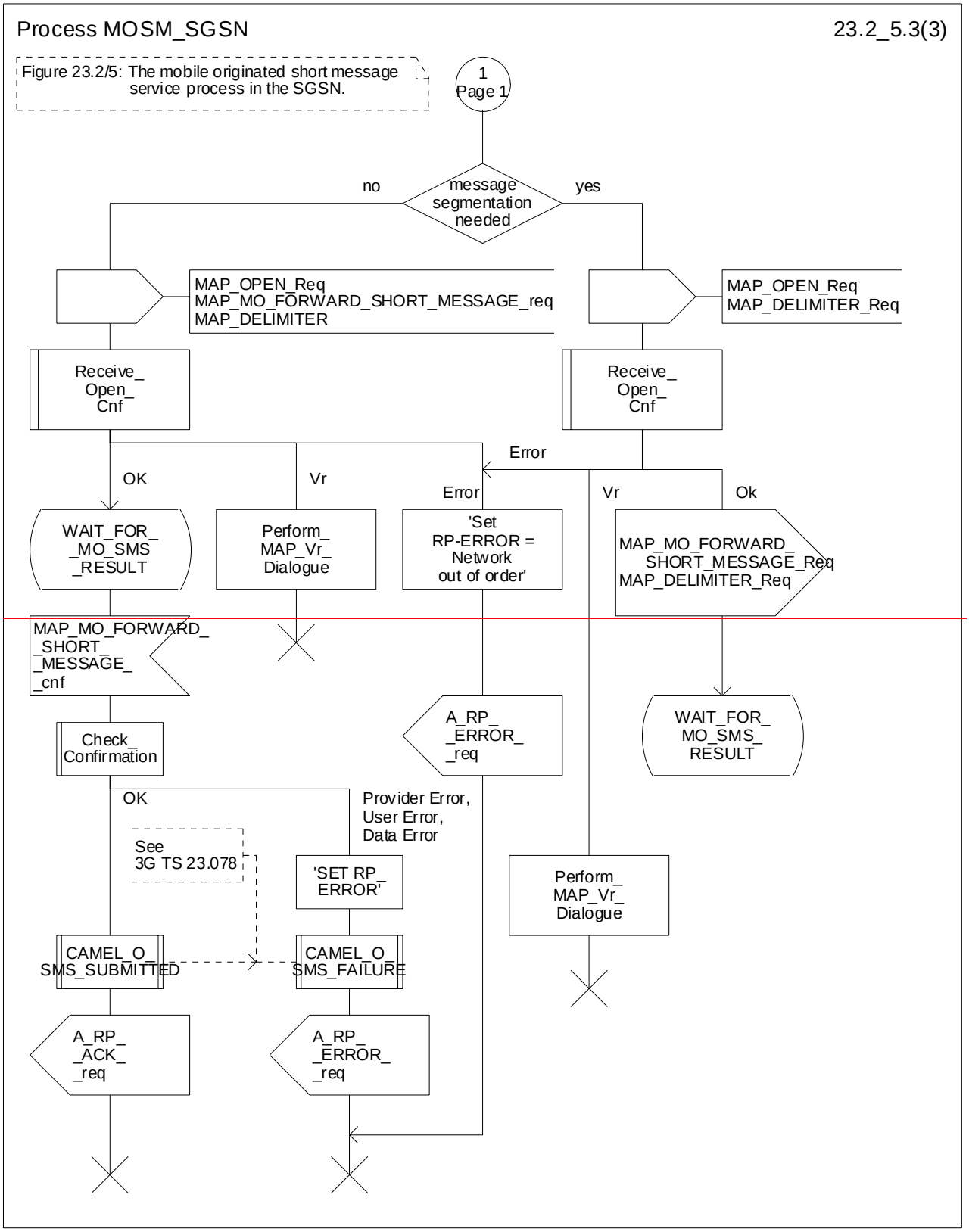


Figure 23.2/5 (sheet 2 of 3): Process MO_SM_SGSN


Process MOSM_SGSN
23.2_5.3(3)
Figure 23.2/5: The mobile originated short message service process in the SGSN.
1
Page 1
message segmentation needed
no
yes
MAP_OPEN_Req
MAP_MO_FORWARD_SHORT_MESSAGE_req
MAP_DELIMITER
MAP_OPEN_Req
MAP_DELIMITER_Req
Receive_ Open_ Cnf
Receive_ Open_ Cnf
Error
OK
Vr
Error
Vr
Ok
WAIT_FOR_ _MO_SMS _RESULT
Perform_ MAP_Vr_ Dialogue
'Set RP-ERROR = Network out of order'
MAP_MO_FORWARD_ SHORT_MESSAGE_Req
MAP_DELIMITER_Req
MAP_MO_FORWARD_ _SHORT_ _MESSAGE_ _cnf
A_RP_ _ERROR_ _req
WAIT_FOR_ MO_SMS_ RESULT
Check_ Confirmation
OK
Provider Error, User Error, Data Error
See 3G TS 23.078
'SET RP_ ERROR'
Perform_ MAP_Vr_ Dialogue
CAMEL_O_ SMS_SUBMITTED
CAMEL_O_ SMS_FAILURE
A_RP_ _ACK_ _req
A_RP_ _ERROR_ _req

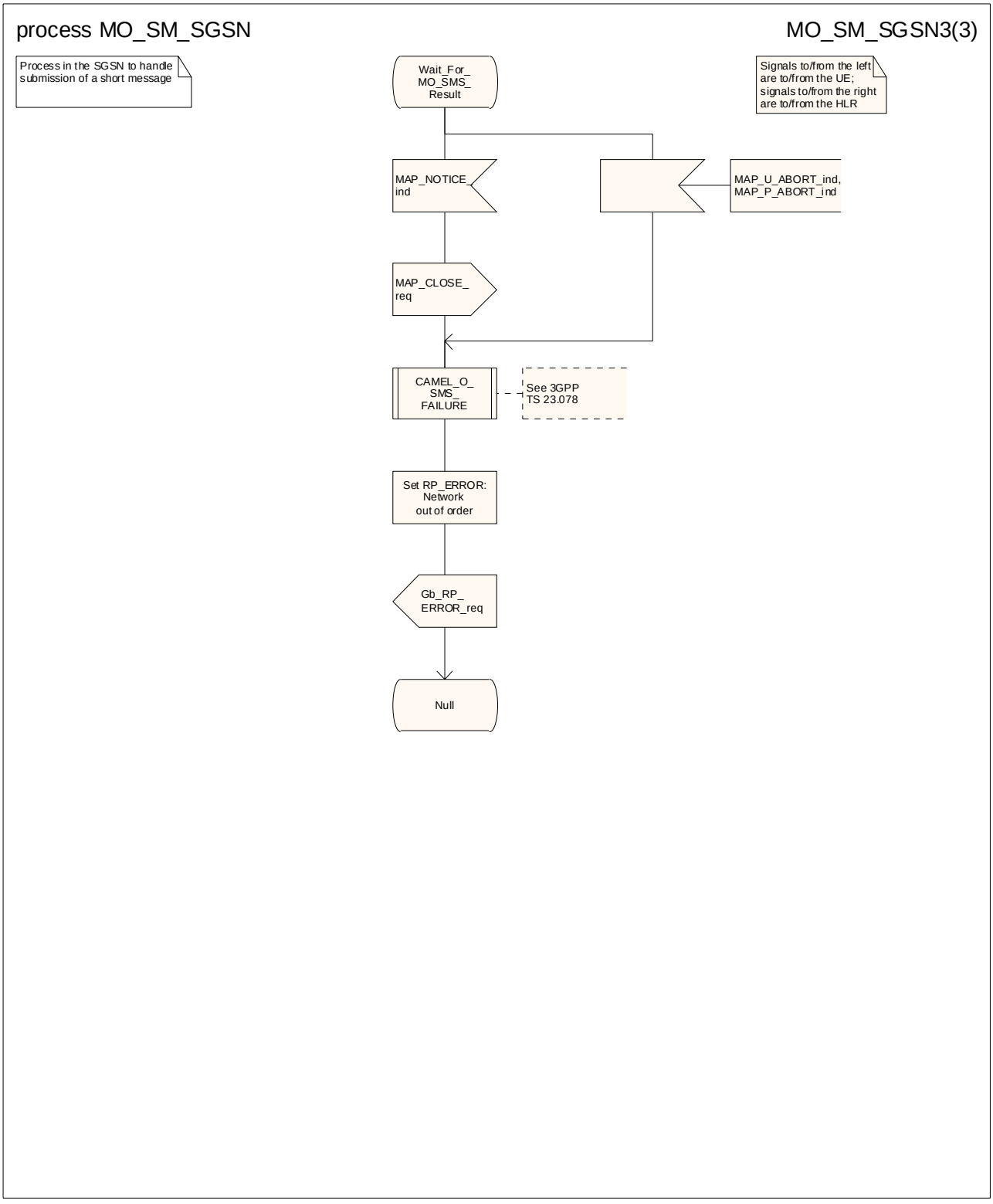


Figure 23.2/5 (sheet 3 of 3): Process MO_SM_SGSN

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