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3RD GENERATION PARTNERSHIP PROJECT 2 "3GPP2"

Mobile Application Part (MAP) -

SMS

REVISION HISTORY

Revision	Date	Remarks
X.S0004-641-E v2.0	July 2007	Incorporated changes from Miscellaneous Rev. E standards.

PART 641

SHORT MESSAGE SERVICE (SMS)

1 SMS DELIVERY BACKWARD

1.1 MSC Initiating SMS Delivery Backward

Upon request to send an MS-originated SMS point-to-point message up the handoff chain, the MSC shall do the following:

1 Include InterMSCCircuitID parameter set to the trunk used in the direction toward the Anchor MSC.

2 IF the MSC is the Serving MSC:

2-1 IF the destination address was provided (by the MS):

2-1-1 Include the SMS_DestinationAddress parameter set to the destination address.

2-2 ENDIF.

2-3 Include the SMS_OriginalDestinationAddress parameter set to the original destination address (provided by the MS).

2-4 IF the original originating address was provided (by the MS):

2-4-1 Include the SMS_OriginalOriginatingAddress parameter set to the original originating address.

2-5 ENDIF.

2-6 Include other parameters as appropriate.

3 ELSE (the MSC is acting as a Tandem MSC for the MS):

3-1 Include all parameters received from the calling task (see Part 540).

4 ENDIF.

5 Send a SMSDeliveryBackward INVOKE message toward the Destination Address.

6 Start the Short Message Backward Timer (SBT).

7 WAIT for an SMS Delivery Backward response:

8 WHEN a RETURN RESULT is received:

8-1 Stop the timer (SBT).

8-2 IF the message can be processed:

8-2-1 IF the SMSDeliveryBackward INVOKE was initiated by an initial Serving MSC:

8-2-1-1 IF an intersystem handoff (handoff forward) has occurred:

8-2-1-1-1 Execute the “MSC Initiating SMS Delivery Point To Point Ack“ task (see Part 641, sec. 4.1).

8-2-1-1-2 Exit this task.

8-2-1-2 ENDIF.

8-2-2 ENDIF.

8-2-3 Relay all parameters received.

8-2-4 Return to the calling task as *accepted*.

8-3 ELSE (the message cannot be processed):

8-3-1 Return to the calling task with the SMS_CauseCode indicating *Other Network Problem*.

8-4 ENDIF.

9 WHEN a FacilitiesRelease INVOKE is received :

9-1 Stop the timer (SBT).

9-2 Exit this task.

10 WHEN a RETURN ERROR[1] is received :

10-1 Stop the timer (SBT).

10-2 Return to the calling task with the SMS_CauseCode indicating *Other Network Problem*.

11 WHEN a REJECT is received:

11-1 Stop the timer (SBT).

11-2 CASE reject problem specifier OF:

11-3 *Unrecognized component*,

11-4 *Incorrect component portion*,

11-5 *Badly structured component portion*,

11-6 *Incorrect parameter*,

11-7 *Unrecognized package type*,

11-8 *Incorrect transaction portion*,

11-9 *Badly structured transaction portion*:

11-9-1 Return to the calling task with the SMS_CauseCode indicating *Encoding Problem*.

11-10 *Unrecognized operation code*:

11-10-1 Return to the calling task with the SMS_CauseCode indicating *SMS not supported*.

11-11 *DEFAULT*:

11-12 Return to the calling task with the SMS_CauseCode indicating *Network failure*.

11-13 ENDCASE:

12 WHEN the timer (SBT) expires:

12-1 Return to the calling task with the SMS_CauseCode indicating *Network failure*.

13 ENDWAIT.

[1] The sending of an SMS DeliveryBackward RETURN ERROR is not recommended and error tables are not supplied.

1.2 MSC Receiving an SMSDeliveryBackward INVOKE

Upon receipt of an SMSDeliveryBackward INVOKE, the MSC shall do the following:

1 IF the received message can be processed:

1-1 IF the SMS_DestinationAddress parameter is received:

1-1-1 Set the destination address with the address in the received SMS_DestinationAddress parameter.

1-2 ENDIF.

1-3 IF the SMS_OriginalDestinationAddress parameter is received:

1-3-1 Set the original destination address with the address in the received SMS_OriginalDestinationAddress parameter.

1-4 ELSE:

1-4-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-4-2 Send a RETURN RESULT.

1-4-3 Exit this task.

1-5 ENDIF.

1-6 IF the SMS_OriginalOriginatingAddress parameter is received:

1-6-1 Set the original originating address with the address in the received SMS_OriginalOriginatingAddress parameter.

1-7 ENDIF.

1-8 Relay all parameters received.

1-9 IF the MSC is the Anchor MSC:

1-9-1 Execute the “Anchor MSC Initiating SMS Delivery Point-To-Point” task (see Part 641, sec. 3.5).

1-9-2 Relay all parameters received.

1-10 ELSE (the MSC is a Tandem MSC):

1-10-1 Execute the “MSC Initiating SMS Delivery Backward” task (see Part 641, sec. 1.1).

1-10-1-1 Discard the InterMSCCircuitID parameter.

1-10-1-2 Relay all parameters received.

1-10-2 ELSE (the handing-off system does not support SMS):

1-10-2-1 Include the SMS_CauseCode parameter set to *Network failure*.

1-10-3 ENDIF.

1-11 ENDIF.

1-12 Send a RETURN RESULT towards the Serving MSC.

2 ELSE (the received message cannot be processed):

2-1 Include the SMS_CauseCode parameter indicating the proper value.

2-2 Send a RETURN RESULT.

3 ENDIF.

4 Exit this task.

2 SMS DELIVERY FORWARD

2.1 MSC Initiating SMS Delivery Forward

Upon request to send an MS terminated SMS point-to-point message down a handoff chain, the MSC shall do the following:

1 Relay included parameters.

2 Include the SMS_OriginalDestinationAddress parameter received from the invoking task.

3 IF the MSC is the Anchor MSC AND IF the MC's address may be sent to the MS:

3-1 Include the SMS_OriginatingAddress parameter set to the originating address.

4 ENDIF.

5 IF the message original originating address is not the same as the originating address:

5-1 Include the SMS_OriginalOriginatingAddress parameter set to the original originating address.

6 ELSEIF the SMS_OriginatingAddress was received from the invoking task:

6-1 Include the received SMS_OriginatingAddress parameter.

7 ENDIF.

8 Send a SMSDeliveryForward INVOKE message toward the MSC currently serving the destination MS.

9 Start the Short Message Forward Timer (SFT).

10 WAIT for an SMS Delivery Forward response:

11 WHEN a RETURN RESULT is received:

11-1 Stop the timer (SFT).

11-2 IF the message can be processed:

11-2-1 Return to the calling task with the received parameters.

11-3 ELSE (the message cannot be processed):

11-3-1 Include the SMS_CauseCode parameter indicating *Other Network Problem*.

11-3-2 Return to the calling task.

11-4 ENDIF.

12 WHEN a RETURN ERROR[1] is received:

12-1 Stop the timer (SFT).

12-2 Include the SMS_CauseCode parameter indicating *Other Network Problem*.

12-3 Return to the calling task.

13 WHEN a REJECT is received:

13-1 Stop the timer (SBT).

13-2 CASE reject problem specifier OF:

13-3 *Unrecognized component*,

13-4 *Incorrect component portion*,

[1] The sending of an SMS DeliveryForward RETURN ERROR is not recommended and error tables are not supplied.

13-5 *Badly structured component portion*,

13-6 *Incorrect parameter*,

13-7 *Unrecognized package type*,

13-8 *Incorrect transaction portion*,

13-9 *Badly structured transaction portion*:

13-9-1 Return to the calling task with the SMS_CauseCode indicating *Encoding Problem*.

13-10 *Unrecognized operation code*:

13-10-1 Return to the calling task with the SMS_CauseCode indicating *SMS not supported*.

13-11 *DEFAULT*

13-11-1 Return to the calling task with the SMS_CauseCode indicating *Network failure*.

13-12 ENDCASE:

14 WHEN the timer (SFT) expires:

14-1 Include the SMS_CauseCode parameter indicating *Network failure*.

14-2 Return to the calling task.

15 ENDWAIT.

2.2 MSC Receiving an SMSDeliveryForward INVOKE

Upon receipt of an SMSDeliveryForward INVOKE, the MSC shall do the following:

1 IF the received message can be processed:

1-1 IF neither the MobileIdentificationNumber or IMSI parameter is received:

1-1-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-1-2 Send a RETURN RESULT.

1-1-3 Exit this task.

1-2 ENDIF.

1-3 IF the SMS_OriginalDestinationAddress parameter is received:

1-3-1 Set the original destination address with the address in the received SMS_OriginalDestinationAddress parameter.

1-4 ELSE:

1-4-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-4-2 Send a RETURN RESULT.

1-4-3 Exit this task.

1-5 ENDIF.

1-6 IF the SMS_OriginatingAddress parameter is received:

1-6-1 Set the originating address with received SMS_OriginatingAddress.

1-7 ENDIF.

1-8 IF the SMS_OriginalOriginatingAddress parameter is received:

1-8-1 Set the original originating address with the address in the received SMS_OriginalOriginatingAddress parameter.

1-9 ELSE:

1-9-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-9-2 Send a RETURN RESULT.

1-9-3 Exit this task.

1-10 ENDIF.

1-11 IF the MSC is the Serving MSC:

1-11-1 IF the MS is currently able to receive SMS messages:

1-11-1-1 Execute the “MSC Initiating SMD-REQUEST toward an MS-Based SME” task (see Part 691, sec. 4).

1-11-1-2 Relay all received parameters.

1-11-2 ELSE (the MS is unable to receive SMS messages):

1-11-2-1 Include the SMS_CauseCode parameter set to the appropriate value.

1-11-3 ENDIF.

1-12 ELSE (this is a Tandem MSC):

1-12-1 IF the next MSC in the handoff chain is known to support SMS:

1-12-1-1 Discard the InterMSCCircuitID parameter.

1-12-1-2 Relay all other received parameters.

1-12-1-3 Execute “MSC Initiating SMS Delivery Forward” (see Part 641, sec. 2.1) toward the Serving MSC in the call.

1-12-1-4 Relay all received parameters.

1-12-2 ELSE (the handed-off system does not support SMS):

1-12-2-1 Include the SMS_CauseCode parameter set to *Network failure*.

1-12-3 ENDIF.

1-13 ENDIF.

2 ELSE (the received message cannot be processed)

2-1 Include the SMS_CauseCode parameter with the appropriate value.

3 ENDIF.

4 Send a RETURN RESULT.

5 Exit this task.

3 SMS DELIVERY POINT-TO-POINT

3.1 Fixed SME Initiating SMS Delivery

Upon a request to deliver a short message, the originating SME shall do the following:

1 IF the request can be processed:

1-1 IF originating supplementary services are required:

1-1-1 Set the destination address to the address of the originating SME's MC.

1-1-2 IF notification is required:

1-1-2-1 Optionally, include the SMS_NotificationIndicator parameter set to *Notify When Available*.

1-1-2-2 Optionally, include the SMS_MessageCount parameter set to the number of queued messages.

1-1-3 ELSE:

1-1-3-1 Include the SMS_NotificationIndicator parameter set to *Do Not Notify When Available*.

1-1-4 ENDIF.

1-2 ELSEIF the destination is known to be an MS-based SME:

1-2-1 IF the originating SME is HLR-based and the MS is subscribed to the HLR and the temporary SMS address for the MS is current (as determined by the HLR):

1-2-1-1 Set the destination address to the temporary SMS address for the addressed MS.

1-2-1-2 Include the ElectronicSerialNumber parameter for the indicated MS.

1-2-1-3 Include the MSID parameter for the indicated MS.

1-2-2 ELSEIF the originating SME is MSC-based and the destination MS-based SME is currently served or anchored by the MSC:

1-2-2-1 Set the destination address to the air interface address of the MS (usually its MSID).

1-2-2-2 Include the ElectronicSerialNumber parameter for the indicated MS.

1-2-2-3 Include the MSID parameter for the indicated MS.

1-2-3 ELSE (the destination address should be treated normally):

1-2-3-1 Set the destination address to the address of the destination MS-based SME (i.e., the address of the destination MS-based SME's MC).

1-2-4 ENDIF.

1-2-5 Include the SMS_NotificationIndicator parameter set to *Do Not Notify When Available*.

1-3 ELSE IF the destination is unknown and originating supplementary services are not required:

1-3-1 Set the destination address to the address of the destination SME.

1-3-2 IF notification is required:

1-3-2-1 Optionally, include the SMS_NotificationIndicator parameter set to *Notify When Available*.

1-3-2-2 Optionally, include the SMS_MessageCount parameter set to the number of queued messages.

1-3-3 ELSE:

1-3-3-1 Include the SMS_NotificationIndicator parameter set to *Do Not Notify When Available*.

1-3-4 ENDIF.

1-4 ELSE (broadcast message):

1-4-1 Set the destination address to the address of the destination MC.

1-5 ENDIF.

1-6 Include the SMS_BearerData parameter set by the SMS teleservice.

1-7 Include the SMS_TeleserviceIdentifier parameter set to identify the SMS teleservice.

1-8 IF a broadcast message needs to be delivered:

1-8-1 Include the BroadcastCategory parameter.

1-8-2 Include other applicable BTTI parameters.

1-9 ENDIF.

1-10 IF the originating SME is MSC-based and the destination is a served MS:

1-10-1 IF the MSC is serving the indicated MS:

1-10-1-1 Execute the “MSC Initiating SMD-REQUEST toward an MS-Based SME” task (see Part 691, sec. 4).

1-10-2 ELSE (the MSC must be the Anchor MSC for the indicated MS):

1-10-2-1 Execute the “MSC Initiating SMS Delivery Forward” task (see Part 641, sec. 2.1).

1-10-3 ENDIF.

1-11 ELSE:

1-11-1 Execute the “Initiating SMS Delivery Point-To-Point” task (see Part 641, sec. 3.2).

1-12 ENDIF.

1-13 IF the request was *accepted*:

1-13-1 Release the message.

1-13-2 Return to the calling task with all received parameters and an *accepted* indication.

1-14 ELSEIF the request was *postponed*:

1-14-1 Return to the calling task with all received parameters and a *postponed* indication.

1-15 ELSE (the request was *denied*):

1-15-1 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).

1-15-2 Return to the calling task with a *denied* indication.

1-16 ENDIF.

2 ELSE:

2-1 Return to the calling task with a *denied* indication.

3 ENDIF.

3.2 Initiating SMS Delivery Point-To-Point

This task assumes that it is called by a higher function capable of acting upon returned SMS_CauseCode appropriately. Upon request, an SME or MC shall do the following:

1 Relay included parameters.

2 IF appropriate:

2-1 Include the SMS_ChargeIndicator parameter set appropriately.

3 ENDIF.

4 IF the underlying transport is not allowed to carry the destination address:

4-1 IF the destination address is not the same as the MSID:

4-1-1 Include the SMS_DestinationAddress parameter set to the destination address.

4-2 ENDIF.

5 ENDIF.

6 IF the short message is not intended to be broadcast (i.e., the BroadcastCategory parameter is not available):

6-1 Include the SMS_OriginalDestinationAddress parameter set to the original destination address.

6-2 IF appropriate:

6-2-1 Include the SMS_OriginalDestinationSubaddress parameter set appropriately.

6-3 ENDIF.

7 ENDIF.

8 IF the underlying transport is not allowed to carry the originating address.

8-1 Include the SMS_OriginatingAddress parameter set to the originating address.

9 ENDIF.

10 Include the SMS_OriginalOriginatingAddress parameter set to the original originating address.

11 IF appropriate:

11-1 Include the SMS_OriginalOriginatingSubaddress parameter set appropriately.

12 ENDIF.

13 Send a SMSDeliveryPointToPoint INVOKE message.

14 Start the SMS Delivery Timer (SMT).

15 WAIT for an SMSDeliveryPointToPoint response:

16 WHEN a RETURN RESULT is received:

16-1 Stop the timer (SMT).

16-2 IF the message can be processed:

16-2-1 IF the SMSDeliveryPointToPoint INVOKE was initiated by an Anchor MSC, in response to a SMD-Request:

16-2-1-1 IF an intersystem handoff (handoff forward) has occurred:

16-2-1-1-1 Execute the “MSC Initiating SMS Delivery Point To Point Ack“ task (see Part 641, sec. 4.1).

16-2-1-1-2 Exit this task.

16-2-1-2 ENDIF.

16-2-2 ENDIF.

16-2-3 IF the SMSDeliveryPointToPoint INVOKE was initiated by an Anchor MSC, in response to a SMSDeliveryBackward INVOKE:

16-2-3-1 IF an intersystem handoff (handoff back) has occurred:

16-2-3-1-1 IF the SMS delivery was successful:

16-2-3-1-1-1 Relay parameters received to the MS.

16-2-3-1-1-2 Send a SMD-ACK to the MS based SME.

16-2-3-1-1-3 Exit this task.

16-2-3-1-2 ELSE:

16-2-3-1-2-1 Relay the indicated SMS CauseCode.

16-2-3-1-2-2 Send a SMD-NAK to the MS based SME.

16-2-3-1-2-3 Exit this task.

16-2-3-1-3 ENDIF.

16-2-3-2 ENDIF.

16-2-3-3 IF an intersystem handoff (handoff to third) has occurred:

16-2-3-3-1 Execute the “MSC Initiating SMS Delivery Point To Point Ack“ task (see Part 641, sec. 4.1).

16-2-3-3-2 Exit this task.

16-2-3-4 ENDIF.

16-2-4 ENDIF.

16-2-5 IF the SMS_CauseCode parameter is received:

16-2-5-1 IF the SMS_CauseCode is *SMS delivery postponed*:

16-2-5-1-1 Return to the calling task with all received parameters and a *postponed* indication

16-2-5-2 ELSEIF the SMS_CauseCode is *Destination Resource Shortage*:

16-2-5-2-1 Execute local recovery procedures to determine when it is acceptable to transmit again to the SME.

16-2-5-2-2 Return to the calling task with all received parameters and a r*efused* indication.

16-2-5-3 ELSEIF the SMS_CauseCode is *Broadcast Periodicity Failure in MSC* (Applicable for MC only).

16-2-5-3-1 Optionally (if supported by the MC), the MC will keep track of MSC refusal to handle Broadcast Periodicity and the MC will handle Broadcast Periodicity on behalf of this MSC.

16-2-5-3-2 Return to the calling task with all received parameters and an *accepted* indication.

16-2-5-4 ELSE:

16-2-5-4-1 Return to the calling task with all received parameters and a r*efused* indication.

16-2-5-5 ENDIF.

16-2-6 ELSE:

16-2-6-1 Return to the calling task with all received parameters and an *accepted* indication.

16-2-7 ENDIF.

16-3 ELSE (the message cannot be processed):

16-3-1 Return to the calling task with a *denied* indication.

16-4 ENDIF.

17 WHEN a RETURN ERROR[1] is received:

17-1 Stop the timer (SMT).

17-2 Set the SMS_CauseCode to *Network failure*.

17-3 Return to the calling task with a *denied* indication.

18 WHEN a REJECT is received:

18-1 Stop the timer (SMT).

18-2 CASE reject problem specifier OF:

18-3 *Unrecognized component*,

18-4 *Incorrect component portion*,

18-5 *Badly structured component portion*,

18-6 *Incorrect parameter*,

18-7 *Unrecognized package type*,

18-8 *Incorrect transaction portion*,

18-9 *Badly structured transaction portion*:

18-9-1 Set the SMS_CauseCode to *Encoding Problem*.

18-10 *Unrecognized operation code*:

18-10-1 Set the SMS_CauseCode to *SMS not supported*.

18-11 *DEFAULT*:

18-11-1 Set the SMS_CauseCode to *Network failure*.

18-12 ENDCASE:

18-13 Return to the calling task with a *denied* indication.

19 WHEN the timer (SMT) expires:

19-1 Return to the calling task with a with a *denied* indication.

20 ENDWAIT.

21 Exit this task.

[1] The sending of an SMS DeliveryPointToPoint RETURN ERROR is not recommended and error tables are not supplied.

3.3 Fixed SME Receiving an SMSDeliveryPointToPoint INVOKE

Upon receipt of a SMSDeliveryPointToPoint INVOKE, the SME shall do the following:

1 IF the message can be processed:

1-1 IF the MSID, ElectronicSerialNumber, SMS_OriginalDestination address or SMS_OriginalDestinationSubaddress parameters are not for this SME:

1-1-1 Include the SMS_CauseCode parameter set to *Address translation failure*.

1-1-2 Send a RETURN RESULT.

1-1-3 Exit this task.

1-2 ENDIF.

1-3 IF the SMS_BearerData parameter is not included:

1-3-1 Include the SMS_CauseCode parameter set to *Missing Mandatory Parameter*.

1-3-2 Send a RETURN RESULT.

1-3-3 Exit this task.

1-4 ENDIF.

1-5 IF the SMS_TeleserviceIdentifier parameter is included:

1-5-1 IF the SMS_TeleserviceIdentifier parameter is known and supported:

1-5-1-1 Process the message with the indicated teleservice.

1-5-1-2 Send an SMSDeliveryPointToPoint RETURN RESULT with parameters loaded according to the teleservice.

1-5-1-3 Exit this task.

1-5-2 ELSE:

1-5-2-1 Include the SMS_CauseCode parameter set to *Invalid Teleservice ID*.

1-5-2-2 Send a RETURN RESULT.

1-5-2-3 Exit this task.

1-5-3 ENDIF.

1-6 ELSE:

1-6-1 Include the SMS_CauseCode parameter set to *Missing Mandatory Parameter*.

1-6-2 Send a RETURN RESULT.

1-6-3 Exit this task.

1-7 ENDIF.

2 ELSE:

2-1 Include the SMS_CauseCode parameter with the appropriate value.

2-2 Send a RETURN RESULT.

3 ENDIF.

4 Exit this task.

3.4 MSC Receiving an SMSDeliveryPointToPoint INVOKE

Upon receipt of an SMSDeliveryPointToPoint INVOKE for an intended MS or for broadcast, the receiving MSC shall do the following:

1 IF the message can be processed:

1-1 IF the ServiceIndicator parameter set to either the CDMA OTASP Service or the CDMA OTAPA Service is received:

1-1-1 IF the SMS_BearerData parameter has a non-zero length:

1-1-1-1 Execute the “MSC Receiving SMDPP INVOKE for OTA Data Message Exchange” task (see Part 640, sec. 44.2).

1-1-2 ELSEIF the ActionCode parameter is received:

1-1-2-1 CASE ActionCode OF:

1-1-2-2 *Attach MSC to OTAF*:

1-1-2-2-1 IF the ServiceIndicator parameter is set to the CDMA OTASP Service value:

1-1-2-2-1-1 Execute the “MSC Receiving SMDPP INVOKE to Attach with OTAF” task (see Part 640, sec. 43.3).

1-1-2-2-2 ELSEIF the ServiceIndicator parameter is set to the CDMA OTAPA Service value:

1-1-2-2-2-1 Include the SMS_CauseCode parameter set to indicate *Unexpected parameter value*.

1-1-2-2-2-2 Send a RETURN RESULT.

1-1-2-2-3 ENDIF.

1-1-2-3 *Initiate RegistrationNotification*:

1-1-2-3-1 Execute the “MSC Receiving SMDPP INVOKE for Registration of MS” task (see Part 640, sec. 45.2).

1-1-2-4 *Release TRN*:

1-1-2-4-1 IF the ServiceIndicator parameter is set to the CDMA OTASP Service value:

1-1-2-4-1-1 Execute the “MSC Receiving SMDPP INVOKE to Release TRN” task (see Part 640, sec. 43.5).

1-1-2-4-2 ELSEIF the ServiceIndicator parameter is set to the CDMA OTAPA Service value:

1-1-2-4-2-1 Include the SMS_CauseCode parameter set to indicate *Unexpected parameter value*.

1-1-2-4-2-2 Send a RETURN RESULT.

1-1-2-4-3 ENDIF.

1-1-2-5 *Record NEWMSID*:

1-1-2-5-1 Execute the “MSC Receiving SMDPP INVOKE to Record NEW MSID” task (see Part 640, sec. 45.4).

1-1-2-6 *DEFAULT*:

1-1-2-6-1 Include the SMS_CauseCode parameter set to indicate *Unexpected parameter value.*

1-1-2-6-2 Send a RETURN RESULT.

1-1-2-7 ENDCASE.

1-1-3 ENDIF.

1-1-4 Exit this task.

1-2 ENDIF.

1-3 IF the SMS_OriginalDestinationAddress parameter is received:

1-3-1 Set the original destination address with the address in the received SMS_OriginalDestinationAddress parameter.

1-4 ELSE:

1-4-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-4-2 Send a RETURN RESULT.

1-4-3 Exit this task.

1-5 ENDIF.

1-6 IF the SMS_OriginatingAddress parameter is received:

1-6-1 Set the originatting address with the SMS_OriginatingAddress.

1-7 ENDIF.

1-8 IF the SMS_OriginalOriginatingAddress parameter is received:

1-8-1 Set the original originating address with the address in the received SMS_OriginalOriginatingAddress parameter.

1-9 ELSE:

1-9-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-9-2 Send a RETURN RESULT.

1-9-3 Exit this task.

1-10 ENDIF.

1-11 IF the SMS_OriginalOriginatingSubaddress parameter is received:

1-11-1 Set the original originating subaddress with the address in the received SMS_OriginalOriginatingSubaddress parameter.

1-12 ENDIF

1-13 IF the BroadcastCategory parameter is received (indicating BTTC):

1-13-1 IF the BroadcastMessageStatus parameter indicates *deletion* is received:

1-13-1-1 IF the BroadcastMessageIdentifier parameter is received:

1-13-1-1-1 IF a broadcast message as indicated by the SMS_OriginalOriginatingAddress parameter and BroadcastMessageIdentifier parameter exists:

1-13-1-1-1-1 IF the broadcasting process is ongoing at the MSC:

1-13-1-1-1-1-1 Wait for the broadcast process to be completed.

1-13-1-1-1-1-2 Delete the broadcast message.

1-13-1-1-1-2 ELSE:

1-13-1-1-1-2-1 Delete the broadcast message immediately.

1-13-1-1-1-3 ENDIF.

1-13-1-1-2 ENDIF.

1-13-1-2 ELSE (deletion of a group of broadcast messages):

1-13-1-2-1 FOR each broadcast message that has matching SMS_OriginalOriginatingAddress and BroadcastCategory parameter values:

1-13-1-2-1-1 IF the broadcasting process is ongoing at MSC:

1-13-1-2-1-1-1 Wait for the broadcast process to be completed.

1-13-1-2-1-1-2 Delete the broadcast message.

1-13-1-2-1-2 ELSE:

1-13-1-2-1-2-1 Delete the broadcast message immediately.

1-13-1-2-1-3 ENDIF.

1-13-1-2-2 ENDFOR.

1-13-1-3 ENDIF.

1-13-1-4 Send a RETURN RESULT.

1-13-1-5 Exit this task.

1-13-2 ENDIF.

1-13-3 IF BroadcastMessageStatus parameter indicates *replacement*:

1-13-3-1 IF message as indicated by the SMS_OriginalOriginatingAddress parameter and BroadcastMessageIdentifier parameter exists:

1-13-3-1-1 Replace the old broadcast message with the received message[1].

1-13-3-2 ELSE:

1-13-3-2-1 Treat the received message as a new broadcast message.

1-13-3-3 ENDIF.

1-13-4 ELSE (BroadcastMessageStatus parameter either has not been received or, if received, indicates *new*):

1-13-4-1 Treat the message as a new broadcast message.

1-13-5 ENDIF.

1-13-6 IF Broadcast Periodicity is requested for a new message and Broadcast Periodicity cannot be supported for this message by this MSC at this time:

1-13-6-1 Include the SMS_CauseCode parameter set to indicate *Broadcast Periodicity Failure in MSC*.

1-13-7 ENDIF.

1-13-8 Send a RETURN RESULT.

1-13-9 Process the broadcast message according to the BroadcastMessagePriority value (if available) and BroadcastPeriodicity value (if available) and execute the “MSC Initiating Broadcast SMD-Request Across the Air Interface” task (see Part 691, Section 4.7) when the initial broadcast of this message should occur.

1-13-10 WHILE any additional broadcasts of this message are required (based on the BroadcastPeriodicity value for this message and the capabilities of the MSC):

1-13-10-1 Execute the “MSC Initiating Broadcast SMD-Request Across the Air Interface” task (see Part 691, Section 4.7) when the next broadcast of this message should occur.

1-13-11 ENDWHILE.

1-13-12 Exit this task.

1-14 ENDIF.

[1] As part of this replacement, the stored priority for this message is replaced by the priority associated to the received message (i.e., the priority indicated by the BroadcastMessagePriority parameter, if that parameter is received, or the default value of normal otherwise). Also, the stored broadcast periodicity for this message is replaced by the value of a received Broadcast-Periodicity parameter, but left unchanged if the BroadcastPeriodicity parameter is not received.

1-15 IF an MSID parameter is received:

1-15-1 Set the MSID to the received MSID parameter.

1-16 ELSE:

1-16-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-16-2 Send a RETURN RESULT.

1-16-3 Exit this task.

1-17 ENDIF.

1-18 IF an ElectronicSerialNumber parameter is received:

1-18-1 Set the ESN to the received ElectronicSerialNumber parameter.

1-19 ENDIF.

1-20 IF the destination MS is anchored by this MSC:

1-20-1 IF the MSC is allowed to terminate a short message to the destination MS according to the SMS_TerminationRestrictions parameter in the destination MS's profile:

1-20-1-1 IF the MSC is currently the Serving MSC:

1-20-1-1-1 IF the MS is currently able to receive an SMS message:

1-20-1-1-1-1 Optionally, take action to keep the MS in a state in which it can receive SMS messages (e.g., take the MS out of sleep mode).

1-20-1-1-1-2 Relay received parameters, except the SMS_ChargeIndicator and SMS_NotificationIndicator parameters.

1-20-1-1-1-3 IF the system is a CDMA System AND IF the MS last registered in an area close to the system border AND IF the MSC is configured to support border system SMS message delivery:

1-20-1-1-1-3-1 Execute the "MSC Attempt Border MSC SMS Message Delivery" task (see Part 641, sec. 3.7).

1-20-1-1-1-4 ELSE:

1-20-1-1-1-4-1 Execute the "MSC Initiating SMD-REQUEST toward an MS-Based SME" task (see Part 691, sec. 4).

1-20-1-1-1-4-2 IF internal algorithms indicate that neighboring MSC(s) should be sent the SMS message:

1-20-1-1-1-4-2-1 FOR each applicable MSC:

1-20-1-1-1-4-2-1-1 Execute the "MSC Initiating InterSystem SMS Page" task (see Part 640, sec. 35.1).

1-20-1-1-1-4-2-2 ENDFOR.

1-20-1-1-1-4-3 ENDIF.

1-20-1-1-1-5 ENDIF.

1-20-1-1-2 ELSEIF the MS is able to receive only a postponed SMS message (e.g., is busy, radio interface resource shortage, destination SME out of service, in a sleep mode or is inactive):

1-20-1-1-2-1 IF the SMS_NotificationIndicator parameter was present in the SMSDeliveryPointToPoint INVOKE and the SMS_NotificationIndicator indicates *Do not notify when available*:

1-20-1-1-2-1-1 Include the SMS_CauseCode parameter set to an appropriate value.

1-20-1-1-2-2 ELSE (notification was requested):

1-20-1-1-2-2-1 Set the *SMS Delivery Pending Flag* for this MS.

1-20-1-1-2-2-2 Include the SMS_CauseCode parameter set to *SMS Delivery Postponed*.

1-20-1-1-2-3 ENDIF.

1-20-1-1-3 ELSE (the MS is not currently able receive an SMS message):

1-20-1-1-3-1 Include the SMS_CauseCode parameter set to *Radio interface incompatibility*.

1-20-1-1-4 ENDIF.

1-20-1-2 ELSE (the MS has been handed off):

1-20-1-2-1 Relay received parameters, except the SMS_ChargeIndicator parameter.

1-20-1-2-2 Execute the “MSC Initiating SMS Delivery Forward” task (see Part 641, sec. 2.1).

1-20-1-3 ENDIF.

(At this point, message relaying had been postponed, denied, or attempted.)

1-20-1-4 IF an SMS_CauseCode has not been included (delivery was successful):

1-20-1-4-1 IF the SMS_NotificationIndicator parameter was received and it indicates *Do not notify when available*:

1-20-1-4-1-1 (Ignore the previously received SMS_MessageCount, if it is present).

1-20-1-4-2 ELSE (notification was requested):

1-20-1-4-2-1 IF the MSC is the Serving MSC:

1-20-1-4-2-1-1 IF the SMS_MessageCount parameter was not received OR IF the received SMS_MessageCount parameter is zero:

1-20-1-4-2-1-1-1 Optionally, restore the MS to its prior state (e.g., restore the MS to sleep mode).

1-20-1-4-2-1-2 ELSE (SMS_MessageCount was non-zero):

1-20-1-4-2-1-2-1 (Keep the MS awake for a while to receive another possible message.)

1-20-1-4-2-1-3 ENDIF.

1-20-1-4-2-2 ENDIF.

1-20-1-4-2-3 IF the SMS_MessageCount parameter was not received OR IF the received SMS_MessageCount parameter is zero:

1-20-1-4-2-3-1 Clear the *SMS Delivery Pending Flag* for this MS.

1-20-1-4-2-4 ENDIF.

1-20-1-4-3 ENDIF.

1-20-1-4-4 Relay the received parameters.

1-20-1-5 ELSE (an SMS_CauseCode has been included):

1-20-1-5-1 IF the SMS_CauseCode is from an MS, but it is not a legitimate SMS_CauseCode for an MS to send (e.g., SMS delivery postponed):

1-20-1-5-1-1 Include the SMS_CauseCode parameter set to *Network failure*.

1-20-1-5-1-2 Relay the other received parameters.

1-20-1-5-2 ELSEIF the SMS_CauseCode was for a *Destination resource shortage*:

1-20-1-5-2-1 Relay all received parameters.

1-20-1-5-2-2 Clear the *SMS Delivery Pending Flag* for this MS.

1-20-1-5-3 ELSEIF the SMS_CauseCode was for a temporary condition:

1-20-1-5-3-1 IF the SMS_NotificationIndicator parameter was present in the SMSDeliveryPointToPoint INVOKE and the SMS_NotificationIndicator indicates *Do not notify when available*:

1-20-1-5-3-1-1 Relay all received parameters.

1-20-1-5-3-2 ELSE (notification was requested):

1-20-1-5-3-2-1 Set the *SMS Delivery Pending Flag* for this MS.

1-20-1-5-3-2-2 Include the SMS_CauseCode parameter set to *SMS Delivery Postponed*.

1-20-1-5-3-2-3 Relay the other received parameters.

1-20-1-5-3-3 ENDIF.

1-20-1-5-4 ELSE (SMS_CauseCode is not for a temporary condition):

1-20-1-5-4-1 Relay all received parameters.

1-20-1-5-5 ENDIF.

1-20-1-6 ENDIF.

1-20-1-7 Send a RETURN RESULT.

1-20-2 ELSE (MSC is not allowed to terminate a short message to the destination MS):

1-20-2-1 Include the SMS_CauseCode parameter indicating termination is *SMS Termination Denied.*

1-20-2-2 Send a RETURN RESULT.

1-20-3 ENDIF.

1-21 ELSE (MS is not anchored by this MSC):

1-21-1 Include the SMS_CauseCode parameter set to *Destination no longer at this address*.

1-21-2 Send a RETURN RESULT.

1-22 ENDIF.

2 ELSE (the received message cannot be processed):

2-1 Include the SMS_CauseCode parameter indicating the proper value.

2-2 Send a RETURN RESULT.

3 ENDIF.

4 Exit this task.

3.5 Anchor MSC Initiating SMS Delivery Point To Point

This task assumes that it is called by a higher function capable of acting upon returned SMS_CauseCode appropriately. It sets the destination address, if not already set, based on the SMS_OriginationRestrictions from the MS profile. Upon request, the Anchor MSC shall do the following:

1 IF the request can be processed:

1-1 IF the SMS_TeleserviceIdentifier parameter is set to *IMS Services Teleservice*:

1-1-1 Include the SMS_DestinationAddress parameter set to the SMS_OriginalDestinationAddress.

1-2 ELSEIF SMS originations are blocked (DEFAULT field of SMS_OriginationRestrictions set to *Block all*):

1-2-1 Include the SMS_CauseCode parameter indicating *SMS Origination Restriction*.

1-2-2 Return to the calling task indicating *denied*.

1-3 ELSEIF the destination address was provided (by the MS):

1-3-1 (do nothing, destination address is already set correctly)

1-4 ELSEIF originations are forced to use indirect routing through the originating subscriber's MC (Force Message Center field of SMS_OriginationRestrictions set to *Force Indirect*):

1-4-1 Include the SMS_DestinationAddress parameter set to the SMS_OriginalOriginatingAddress.

1-5 ELSEIF visited MSC network operator policy dictates that SMS originations shall use indirect routing:

1-5-1 Include the SMS_DestinationAddress parameter set to the SMS_OriginalOriginatingAddress.

1-6 ELSE

1-6-1 Include the SMS_DestinationAddress parameter set to the SMS_OriginalDestinationAddress.

1-7 ENDIF

1-8 Relay all included parameters.

1-9 Execute the "Initiating SMS Delivery Point-To-Point" task (see Part 641, sec. 3.2).

1-10 Return to the calling task with the received parameters and the returned indication.

2 ELSE (request cannot be processed):

2-1 Include the SMS_CauseCode parameter indicating the appropriate value.

2-2 Return to the calling task indicating *denied*.

3 ENDIF.

4 Exit this task.

3.6 MC Receiving an SMSDeliveryPointToPoint INVOKE

Upon receipt of a SMSDeliveryPointToPoint INVOKE, the MC shall do the following:

1 IF the message can be processed:

1-1 IF the SMS_DestinationAddress parameter is received:

1-1-1 Set the destination address with the address in the received SMS_DestinationAddress parameter.

1-2 ELSEIF the underlying transport can carry the destination address:

1-2-1 Set the destination address with the destination address used by the underlying transport mechanism.

1-3 ELSEIF the MSID parameter is received:

1-3-1 Set the destination address to the MSID.

1-4 ELSE:

1-4-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-4-2 Send a RETURN RESULT.

1-4-3 Exit this task.

1-5 ENDIF.

1-6 IF the SMS_OriginalDestinationAddress parameter is received:

1-6-1 Set the original destination address with the address in the received SMS_OriginalDestinationAddress parameter.

1-7 ELSE:

1-7-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-7-2 Send a RETURN RESULT.

1-7-3 Exit this task.

1-8 ENDIF.

1-9 IF the SMS_OriginatingAddress parameter is received:

1-9-1 Set the originating address with received SMS_OriginatingAddress.

1-10 ELSE:

1-10-1 Set the originating address with the originating address used by the underlying transport mechanism.

1-11 ENDIF.

1-12 IF the SMS_OriginalOriginatingAddress parameter is received:

1-12-1 Set the original originating address with the address in the received SMS_OriginalOriginatingAddress parameter.

1-13 ELSE:

1-13-1 Include the SMS_CauseCode parameter set to *Missing Expected Parameter*.

1-13-2 Send a RETURN RESULT.

1-13-3 Exit this task.

1-14 ENDIF.

1-15 IF indirect routing may have been used (e.g., if the original originating address is the same as the destination address or if the MSID has been received and is in a range of MSIDs

homed to this MC) AND IF the originating address is *not* the address of this MC (originating supplementary services may have been requested):

1-15-1 IF the original originating address is recognized as one that does not identify a SME homed to this MC, OR IF the Teleservice is recognized as one that is not legitimate for the subscriber:

1-15-1-1 Include the SMS_CauseCode parameter indicating the proper value (e.g., *SMS origination denied, Supplementary service not supported*).

1-15-1-2 Send a RETURN RESULT.

1-15-2 ELSE:

1-15-2-1 Process the message with the indicated teleservice for immediate originating supplementary service processing (e.g., unacceptable bearer data, canned responses for delivery schedules) indicated by the message or the originating subscriber's SMS profile information.

1-15-2-2 Send a RETURN RESULT message with parameters loaded according to the teleservice.

1-15-2-3 Execute the "Originating MC Supplementary Services" task (see Part 641, sec. 4.4).

1-15-3 ENDIF.

1-16 ELSEIF a BroadcastCategory parameter is received (indicating BTTC):

1-16-1 Send a RETURN RESULT.

1-16-2 IF the MC may be or may become responsible for handling periodicity of this broadcast message for any MSC:

1-16-2-1 IF the BroadcastMessageStatus parameter indicates *deletion*:

1-16-2-1-1 Execute the "MC Processing Broadcast SMS Delivery Point-To-Point" task (see 3.9).

1-16-2-1-2 IF a BroadcastMessageIdentifier parameter is received:

1-16-2-1-2-1 IF a broadcast message as indicated by the SMS_OriginalOriginatingAddress value and BroadcastMessageIdentifier value exists:

1-16-2-1-2-1-1 Delete the broadcast message.

1-16-2-1-2-2 ENDIF.

1-16-2-1-3 ELSE (deletion of a group of broadcast messages).

1-16-2-1-3-1 FOR each broadcast message that has matching BroadcastCategory and SMS_OriginalOriginatingAddress values:

1-16-2-1-3-1-1 Delete the broadcast message.

1-16-2-1-3-2 ENDFOR.

1-16-2-1-4 ENDIF.

1-16-2-1-5 Exit this task.

1-16-2-2 ENDIF.

1-16-2-3 IF the BroadcastMessageStatus parameter indicates *replacement*:

1-16-2-3-1 IF a broadcast message as indicated by the SMS_OroginalOriginatingAddress value and BroadcastMessageIdentifier value exists:

1-16-2-3-1-1 Replace the old message with the received broadcast message[1].

1-16-2-3-2 ELSE:

1-16-2-3-2-1 Treat the received message as a new broadcast message.

1-16-2-3-3 ENDIF.

1-16-2-4 ELSE (a BroadcastMessageStatus parameter either has not been received or, if received, indicates *new*):

1-16-2-4-1 Schedule delivery of the broadcast message based on the BroadcastPeriodicity parameter value.

1-16-2-4-2 Once ready for delivery, execute the “MC Processing Broadcast SMS Delivery Point-To-Point” task (see 3.9) with an indication of *Initial Transmission*.

1-16-2-4-3 WHILE any additional deliveries of this message are required (based on the BroadcastPeriodicity parameter value for this broadcast message):

1-16-2-4-3-1 Execute the “MC Processing Broadcast SMS Delivery Point-To-Point” task (see 3.9) when the next delivery of this message should occur.

1-16-2-4-4 ENDWHILE.

1-16-2-4-5 Exit this task.

1-16-2-5 ENDIF.

1-16-3 ENDIF.

1-16-4 Execute the “MC Processing Broadcast SMS Delivery Point-To-Point” task (see 3.9) with an indication of *Initial Transmission.*

1-17 ELSEIF the MC may be the destination MC (e.g.. the original destination address is the same as the destination address) (terminating supplementary services may have been requested):

1-17-1 IF the destination address is recognized as one that does not identify a SME homed to this MC, the destination is determined to not be a legitimate subscriber or the Teleservice is determined to be not legitimate for the subscriber

1-17-1-1 Include the SMS_CauseCode parameter indicating the proper value (e.g., *Address translation failure, Address vacant, Invalid Teleservice ID, SMS termination denied, Supplementary service not supported, SMS not supported*).

1-17-1-2 Send a RETURN RESULT.

1-17-2 ELSE:

1-17-2-1 Process the message with the indicated teleservice for immediate terminating supplementary service processing (e.g., unacceptable bearer data, canned responses for on vacation, travel schedules) indicated by the message or the destination subscriber’s SMS profile information.

1-17-2-2 Send an SMSDeliveryPointToPoint RETURN RESULT message with parameters loaded according to the teleservice.

1-17-2-3 Execute the “Terminating MC Supplementary Services” task (see Part 641, sec. 4.5).

1-17-3 ENDIF.

1-18 ELSE (the message has been misrouted to this MC):

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[1] As part of this replacement, the stored priority for this message is replaced by the priority associated to the received message (i.e., the priority indicated by the BroadcastMessagePriority parameter, if that parameter is received, or the default value of normal otherwise). Also, the stored broadcast periodicity for this message is replaced by the value of a received Broadcast-Periodicity parameter, but left unchanged if the BroadcastPeriodicity parameter is not received.

1-18-1 Include the SMS_CauseCode parameter indicating the proper value.

1-18-2 Send a RETURN RESULT.

1-19 ENDIF.

2 ELSE (the message cannot be processed):

2-1 Include the SMS_CauseCode parameter indicating the proper value.

2-2 Send a RETURN RESULT.

3 ENDIF.

4 Exit this task.

3.7 MSC Attempt Border MSC SMS Message Delivery (new)

Upon request, the Serving MSC shall do the following to attempt delivery of an SMS message to an MS-based SME that may be located in a Border MSC at the time of the delivery attempt:

1 IF the indicated MS is known to be served by a Border MSC for SMS message delivery (i.e., Intersystem Paging for SMS message delivery with the Border MSC was successful):

1-1 Include all appropriate parameters.

1-2 Send an InterSystemSMSDeliveryPointToPoint INVOKE to the Border MSC that is serving the MS for SMS message delivery.

1-2-1 Start the InterSystem SMS Delivery Timer (ISSMT).

1-2-2 WAIT for a response:

1-2-3 WHEN a RETURN RESULT is received:

1-2-3-1 Stop the timer (ISSMT).

1-2-3-2 IF the message can be processed:

1-2-3-2-1 Relay all received parameters.

1-2-3-3 ELSE:

1-2-3-3-1 Include the SMS_CauseCode parameter set to an appropriate value.

1-2-3-4 ENDIF.

1-2-4 WHEN a RETURN ERROR or REJECT is received:

1-2-4-1 Stop the timer (ISSMT).

1-2-4-2 Include the SMS_CauseCode parameter set to an appropriate value.

1-2-5 WHEN the timer (ISSMT) expires:

1-2-5-1 Include the SMS_CauseCode parameter set to an appropriate value.

1-2-6 ENDWAIT.

1-2-7 Return to the calling task.

2 ELSEIF the LocationAreaID for the MS is known:

2-1 Page the MS locally with the SMS service option within the area defined for the LocationAreaID.

3 ELSE:

3-1 Page the MS locally with the SMS service option within the entire service area.

4 ENDIF.

5 Spawn the “MSC Initiating an InterSystemPage2” task as an independent task (see Part 690, Section 33.1).

6 Start a page response timer.

7 WAIT for a page response:

8 WHEN a local page response is received:

8-1 Stop the page response timer.

8-2 IF the RELEASE message is supported:

8-2-1 IF responses to InterSystemPage2 are pending:

8-2-1-1 Spawn the “MSC Initiating a RELEASE” task as an independent task (see Part 640, Section 58.1).

8-2-2 ENDIF.

8-3 ENDIF.

8-4 IF the page response indicates a service rejected by the MS:

8-4-1 Include the SMS_CauseCode parameter set to an appropriate value.

8-4-2 Return to the calling task.

8-5 ENDIF.

8-6 Process the MS presence confirmation procedure.

8-7 IF the MS presence confirmation fails:

8-7-1 Include the SMS_CauseCode parameter set to an appropriate value.

8-7-2 Return to the calling task.

8-8 ENDIF.

8-9 Execute the “MSC Initiating SMD-REQUEST toward an MS-Based SME” task (see Part 691, Section 4).

8-10 Relay all received parameters.

9 WHEN an indication from the “MSC Initiating an InterSystemPage2” task is received:

9-1 IF an *MS Ready* indication is received:

9-1-1 Stop the page response timer.

9-1-2 Include all appropriate parameters.

9-1-3 Send an InterSystemSMSDeliveryPointToPoint INVOKE to the MSC that provided the intersystem page response.

9-1-4 Start the InterSystem SMS Delivery Timer (ISSMT).

9-1-5 WAIT for a response:

9-1-6 WHEN a RETURN RESULT is received:

9-1-6-1 Stop the timer (ISSMT).

9-1-6-2 IF the message can be processed:

9-1-6-2-1 Relay all received parameters.

9-1-6-3 ELSE:

9-1-6-3-1 Include the SMS_CauseCode parameter set to an appropriate value.

9-1-6-4 ENDIF.

9-1-7 WHEN a RETURN ERROR or REJECT is received:

9-1-7-1 Stop the timer (ISSMT).

9-1-7-2 Include the SMS_CauseCode parameter set to an appropriate value.

9-1-8 WHEN the timer (ISSMT) expires:

9-1-8-1 Include the SMS_CauseCode parameter set to an appropriate value.

9-1-9 ENDWAIT.

9-2 ELSEIF an Authentication Failed indication is received:

9-2-1 Include the SMS_CauseCode parameter set to an appropriate value.

9-3 ELSE:

9-3-1 IF the AccessDeniedReason parameter is received AND IF the AccessDeniedReason parameter has the value *Busy*:

9-3-1-1 Stop the page response timer.

9-3-1-2 Include the SMS_CauseCode parameter set to indicate *Destination busy*.

9-3-2 ELSEIF a local page response is still pending:

9-3-2-1 Remain in this state.

9-3-3 ENDIF.

9-4 ENDIF.

10 WHEN the page response timer expires:

10-1 Include the SMS_CauseCode parameter set to indicate *No page response*.

11 ENDWAIT.

12 Return to the calling task.

3.8 MSC Receiving InterSystemSMSDeliveryPointToPoint INVOKE (new)

Upon receipt of an InterSystemSMSDeliveryPointToPoint INVOKE for an MS, the receiving MSC shall do the following:

1 IF the ISMDWT timer is running for the indicated MS:

1-1 Stop the timer.

2 ELSEIF an SMS delivery inactivity timer is running for the indicated MS:

2-1 Stop the timer.

3 ELSE:

3-1 Include the SMSCauseCode parameter set to the appropriate value.

3-2 Send a RETURN RESULT.

3-3 Exit this task.

4 ENDIF.

5 IF the message can be processed:

5-1 IF an MSID parameter is received:

5-1-1 Set the MSID to the received MSID parameter value.

5-2 ELSE:

5-2-1 Include the SMS_CauseCode parameter set to indicate *Missing Expected Parameter*.

5-2-2 Send a RETURN RESULT.

5-2-3 Exit this task.

5-3 ENDIF.

5-4 Include the OriginalOriginatingAddress parameter set to the received original originating address.

5-5 IF the OriginalOriginatingSubadddress is supplied:

5-5-1 Include the OriginalOriginatingSubaddress parameter.

5-6 ENDIF.

5-7 Set the TeleserviceIdentifier to the value of the received SMS_TeleserviceIdentifier parameter.

5-8 Set the BearerData to the contents of the received SMS_BearerData parameter.

5-9 Send an SMD-REQUEST toward the indicated MS.

5-10 Start the Short Message Air Delivery Timer (SADT).

5-11 WAIT for an SMD-ACK or SMD-NAK response:

5-12 WHEN an SMD-ACK is received:

5-12-1 Stop timer (SADT).

5-13 WHEN an SMD-NAK is received:

5-13-1 Stop timer (SADT).

5-14 WHEN the timer (SADT) expires:

5-14-1 Include the SMS_CauseCode parameter set to *No acknowledgment*.

5-15 ENDWAIT.

(At this point, message relaying has been denied or attempted.)

5-16 IF an SMS_CauseCode has not been received from the MS (delivery was successful):

5-16-1 Set the SMS_Bearer Data parameter to the received bearer data, if any.

5-16-2 IF the SMS_MessageCount parameter was not received OR IF the received SMS_MessageCount parameter has the value zero:

5-16-2-1 Release the MS from the traffic channel.

5-16-2-2 Execute the “MSC Initiating MS Registration” task (see Part 640, sec. 57.1).

5-16-3 ELSE:

5-16-3-1 Start a traffic channel inactivity (guard) timer.

5-16-4 ENDIF.

5-17 ELSE (an SMS_CauseCode has been received from the MS):

5-17-1 IF the SMS_CauseCode is from an MS, but it is not a legitimate SMS_CauseCode for an MS to send (e.g., SMS delivery postponed):

5-17-1-1 Include the SMS_CauseCode parameter set to *Network failure*.

5-17-2 ELSE:

5-17-2-1 Relay the received SMS_CauseCode value.

5-17-3 ENDIF.

5-17-4 Release the MS from the traffic channel.

5-18 ENDIF.

5-19 Send a RETURN RESULT.

6 ELSE (the received message cannot be processed):

6-1 Include the SMS_CauseCode parameter indicating the proper value.

6-2 Send a RETURN RESULT.

7 ENDIF.

8 Exit this task.

3.9 MC Processing Broadcast SMS Delivery Point-To-Point

Upon request to send a broadcast SMS message, the MC shall do the following:

1 IF an indication of *Initial Transmission* was received:

1-1 Relay that indication.

2 ENDIF.

3 IF PreferredLanguageIndicator parameter is received:

3-1 Perform any necessary technology specific remapping of the PreferredLanguageIndicator parameter value.

4 ENDIF.

5 Execute the “MC Initiating Broadcast SMS Delivery Point-To-Point” task (see 3.10).

6 Return to calling task.

3.10 MC Initiating Broadcast SMS Delivery Point-To-Point

Upon request to send a broadcast SMS message, the MC shall do the following:

1 Map the geographical zone given in the BroadcastZoneIdentifier parameter or BroadcastZoneIdentifierList parameter onto the appropriate MSCs.

2 IF the available BroadcastMessage Status parameter indicates *deletion*:

2-1 FOR each identified MSC handling periodicity control for the identified broadcast message (if the BroadcastMessageIdentifier parameter was received) or for any of the identified broadcast messages (if the BroadcastMessageIdentifier parameter was not received)[1]:

2-1-1 Set the underlying transport destination address to the MSC address.

2-1-2 Relay the SMS_BearerData parameter.

2-1-3 Relay the SMS_TeleserviceIdentifier parameter.

2-1-4 Relay the BroadcastCategory parameter.

2-1-5 Include the SMS_OriginalOriginatingAddress set to identify the SME.

2-1-6 IF the BroadcastMessageIdentifier parameter was received:

2-1-6-1 Relay the BroadcastMessageIdentifier parameter.

2-1-7 ENDIF.

2-1-8 Relay the BroadcastMessageStatus parameter.

2-1-9 IF appropriate:

2-1-9-1 Include the BroadcastZoneIdentifier parameter or the BroadcastZoneIdentifierList parameter.

2-1-10 ENDIF.

2-1-11 Execute the “Initiating SMS Delivery Point-To-Point” task (see 3.2).

2-1-12 IF the indication was not accepted:

2-1-12-1 Execute the “Local Recovery Procedures” task (see Part 630, sec. 5.1).

2-1-13 ENDIF.

2-2 ENDFOR.

2-3 Return to the calling task.

3 ENDIF

4 FOR each identified MSC (an SMSDeliveryPointToPoint INVOKE will be sent):

4-1 IF an indication of *Initial Transmission* was received OR IF the MC is responsible for handling periodicity of this broadcast message for the MSC.

4-1-1 Include the SMS_BearerData parameter set by the SMS teleservice.

4-1-2 Include the SMS_TeleserviceIdentifier parameter set appropriately.

4-1-3 Include the BroadcastCategory parameter.

4-1-4 IF appropriate:

4-1-4-1 Include the BroadcastCategorySpecificInformation parameter set appropriately.

4-1-5 ENDIF.

4-1-6 IF appropriate:

4-1-6-1 Include the BroadcastMessageIdentifier parameter.

[1] A Broadcast Message of the identified category from the SME that originates the message (SMS_OriginalOriginatingAddress).

4-1-7 ENDIF.
4-1-8 IF appropriate:
4-1-8-1 Include the PreferredLanguageIndicator parameter set appropriately.
4-1-9 ENDIF.
4-1-10 IF the MSC is responsible for handling broadcast periodicity:
4-1-10-1 IF the BroadcastPeriodicity parameter is available:
4-1-10-1-1 Include the BroadcastPeriodicity parameter set appropriately.
4-1-10-2 ENDIF.
4-1-10-3 IF the BroadcastMessageStatus parameter was received:
4-1-10-3-1 Relay the BroadcastMessageStatus parameter.
4-1-10-4 ENDIF.
4-1-11 ENDIF.
4-1-12 IF appropriate:
4-1-12-1 Include the BroadcastServiceGroup parameter set appropriately.
4-1-13 ENDIF.
4-1-14 IF appropriate:
4-1-14-1 Include the BroadcastZoneIdentifier parameter or the BroadcastZoneIdentifierList parameter.
4-1-15 ENDIF.
4-1-16 Execute the “Initiating SMS Delivery Point-To-Point” task (see 3.2).
4-1-17 IF an indication of accepted was not received:
4-1-17-1 Execute the “Local Recovery Procedures” task (see Part 630, sec. 5.1).
4-1-18 ENDIF.
4-2 ENDIF.
5 ENDFOR.
6 Return to the calling task.

4 SMS DELIVERY POINT TO POINT ACK

4.1 MSC Initiating SMS Delivery Point To Point Ack

Upon request to send a Short Message acknowledgment to an MS originated short message, when an MS undergoes handoff after initiating an SMS origination:

1 Relay included parameters.

2 Set the underlying transport destination address and the message destination to the next MSC in the handoff chain.

3 Include InterMSCCircuitID parameter set to the trunk used in the direction toward the Serving MSC.

4 Include SMS_TransactionID parameter to identify the MS which originated the SMS.

5 IF either the IMSI parameter or the MobileIdentificationNumber parameter is available:

5-1 Include the IMSI parameter, or the MobileIdentificationNumber parameter, or both parameters.

6 ENDIF.

7 Send a SMSDeliveryPointToPointAck INVOKE message toward the destination address.

8 Exit this task.

4.2 MSC Receiving an SMSDeliveryPointToPointAck INVOKE

Upon receipt of an SMSDeliveryPointToPointAck INVOKE, the MSC shall do the following:

1 IF the received message can be processed:
1-1 IF the MSC is a Serving MSC:
1-1-1 Relay parameters received to the MS.
1-1-2 IF the MS is still being served:
1-1-2-1 IF the SMS delivery was successful:
1-1-2-1-1 Relay parameters received to the MS.
1-1-2-1-2 Send a SMD-ACK to the MS based SME.
1-1-2-2 ELSE:
1-1-2-2-1 Relay the indicated SMS_CauseCode.
1-1-2-2-2 Send an SMD-NAK to the MS based SME.
1-1-2-3 ENDIF.
1-1-3 ELSE:
1-1-3-1 Discard the message.
1-1-4 ENDIF.
1-2 ELSE (the MSC is a Tandem MSC):
1-2-1 IF the next MSC in the handoff chain is known to support SMS:
1-2-1-1 Discard the InterMSCCircuitID parameter.
1-2-1-2 Relay all parameters received.
1-2-1-3 Execute the “MSC Initiating SMS Delivery Point To Point Ack“ task (see Part 641, sec. 4.1).
1-2-2 ENDIF.
1-3 ENDIF.
2 ENDIF.
3 Exit this task.

4.3 OTAF Receiving SMSDeliveryPointToPoint INVOKE

Upon receipt of a SMSDeliveryPointToPoint INVOKE, the OTAF shall do the following:

1 IF the request cannot be processed:
1-1 Include the SMS_CauseCode parameter with the appropriate value.
1-2 Send a RETURN RESULT.
1-3 Exit this task.
2 ENDIF.
3 IF the MSID parameter is included:
3-1 Set the MSID to the received MSID parameter value.
4 ELSE:
4-1 Include the SMS_CauseCode parameter set to *Missing Mandatory Parameter*.
4-2 Send a RETURN RESULT.
4-3 Exit this task.
5 ENDIF.
6 IF the ElectronicSerialNumber parameter is included:
6-1 Set the ESN to the received ElectronicSerialNumber parameter value.
7 ELSE:
7-1 Include the SMS_CauseCode parameter set to *Missing Mandatory Parameter*.
7-2 Send a RETURN RESULT.
7-3 Exit this task.
8 ENDIF.
9 IF the SMS_BearerData parameter is included:
9-1 Set the bearer data to the recieved SMS_BearerData parameter
10 ELSE:
10-1 Include the SMS_CauseCode parameter set to *Missing Mandatory Parameter*.
10-2 Send a RETURN RESULT.
10-3 Exit this task.
11 ENDIF.
12 IF the SMS_TeleserviceIdentifier parameter is included:
12-1 IF the SMS_TID is set to a known and supported value:
12-1-1 Process the message with the indicated teleservice.
12-1-2 Send an SMSDeliveryPointToPoint RETURN RESULT with the parameters loaded according to the teleservice.
12-1-3 Exit this task.
12-2 ELSE:
12-2-1 Include the SMS_CauseCode parameter set to *Invalid TeleserviceIdentifier*.
12-2-2 Send a RETURN RESULT.
12-2-3 Exit this task.
12-3 ENDIF.
13 ELSE:

13-1 Include the SMS_CauseCode parameter set to *Missing Mandatory Parameter*.

13-2 Send a RETURN RESULT.

13-3 Exit this task.

14 ENDIF.

4.4 Originating MC Supplementary Services

When the Originating MC is ready to processes a pending SMSDeliveryPointToPoint INVOKE, the MC shall do the following:

1 Perform any delayed originating supplementary services (e.g., delayed delivery, repeated delivery, distribution list) indicated by the message or the originating subscriber's SMS profile information.

2 WHILE originating supplementary service remains incomplete:

2-1 Schedule the message for delivery and, when ready, continue.

2-2 Set the destination address appropriately (e.g. to the original destination address).

2-3 Set the originating address to the address of this MC (to prevent looping).

2-4 Erase the MSID (of the originating mobile).

2-5 Include the SMS_BearerData parameter set by the SMS teleservice.

2-6 Include the SMS_TeleserviceIdentifier parameter set to identify the SMS teleservice.

2-7 Execute the "Initiating SMS Delivery Point-To-Point" task (see Part 641, sec. 3.2).[1]

2-8 IF the request is accepted:

2-8-1 IF the supplementary service is complete:

2-8-1-1 Release storage for the message.

2-8-1-2 Exit this task.

2-8-2 ENDIF.

2-9 ELSE (the request is *denied*):

2-9-1 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

2-10 ENDIF.

3 ENDWHILE.

4 Exit this task.

[1] This message may be internal to a single MC when the originating SME and destination SME are served by the same MC.

4.5 Terminating MC Supplementary Services

When the terminating MC is ready to processes a pending SMSDeliveryPointToPoint INVOKE, the MC shall do the following:

1 Perform any delayed terminating supplementary services (e.g., delivery to an MS-based SME, message screening) indicated by the message or the destination subscriber's SMS profile information.

2 Set the originating address to the address of this MC (to prevent looping).

3 WHILE terminating supplementary service remains incomplete:

3-1 Schedule the message for delivery and, when ready, continue.

3-2 IF the original destination address is for a fixed SME:

3-2-1 Set the destination address equal to the original destination address.

3-2-2 Include the SMS_BearerData parameter set by the SMS teleservice.

3-2-3 Include the SMS_TeleserviceIdentifier parameter set to identify the SMS teleservice.

3-2-4 Execute the "Initiating SMS Delivery Point-To-Point" task (see Part 641, sec. 3.2).

3-3 ELSE (the SME is MS based):

3-3-1 Execute the "MC or OTAF Initiating SMS Delivery Point-To-Point to an MS-Based SME" task (see Part 641, sec. 4.6).

3-3-2 IF the request was *denied*:

3-3-2-1 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

3-3-3 ENDIF.

3-4 ENDIF.

4 ENDWHILE.

5 Perform requested post transmission terminating supplementary services (e.g., delivery notification).

6 Release storage for the message.

7 Exit this task.

4.6 MC or OTAF Initiating SMS Delivery Point To Point to an MS-Based SME

Upon request to send a point-to-point SMS message to an MS-based SME, the MC or OTAF shall do the following:

1 IF notification is already pending for this MSID:

1-1 GOTO Wait for Notification.

2 ENDIF.

3 IF the address for the indicated MS is not current (as determined by internal algorithms of the MC:

Get SMS Address:

3-1 IF notification of the presence of the MS is required:

3-1-1 Optionally, include the SMS_NotificationIndicator parameter set to *Notify when available.*

3-2 ELSE:

3-2-1 Include the SMS_NotificationIndicator parameter set to *Do not notify when available.*

3-3 ENDIF.

3-4 Execute the “MC or OTAF Initiating SMS Request” task (see Part 641, sec. 6.1).

3-5 IF the request was *accepted*:

3-5-1 Store the temporary routing address and the current time.

3-6 ELSEIF the request was *denied* or *unavailable*:

3-6-1 IF the MS is the sender:

3-6-1-1 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).

3-6-2 ELSE:

3-6-2-1 Execute the “MC or OTAF Initiating SMS Request” task (see Part 641, sec. 6.1).

3-6-3 ENDIF.

3-6-4 Exit this task.

3-7 ELSE (the request was postponed which can only happen when notification is requested):

Wait for Notification:

3-7-1 Queue the request.

3-7-2 WAIT for MS to become available to receive a message:

3-7-3 WHEN SMSNotification is passed :

3-7-3-1 Remove the request from the queue.

3-7-3-2 Store the temporary routing address and the current time.

3-7-4 WHEN the validity of the message expires:

3-7-4-1 Remove the request from the queue.

3-7-4-2 Exit this task.

3-7-5 ENDWAIT.

3-8 ENDIF.

4 ENDIF.

5 IF notification of the presence of the MS is required:

5-1 Optionally, include the SMS_NotificationIndicator parameter set to *Notify when available.*

5-2 Optionally, include the SMS_MessageCount parameter set to the number of messages pending delivery to this MS.

6 ELSE:

6-1 Include the SMS_NotificationIndicator parameter set to *Do not notify when available.*

7 ENDIF.

8 Set the destination address to the temporary routing address of the MS (from the SMS_Address parameter).

9 Include the MSID parameter set to identify the destination MS.

10 Include the ElectronicSerialNumber parameter set to further identify the destination MS.

11 Include the SMS_BearerData parameter set by the SMS teleservice.

12 Include the SMS_TeleserviceIdentifier parameter set to identify the SMS teleservice.

13 Execute the “Initiating SMS Delivery Point-To-Point” task (see Part 641, sec. 3.2).

14 IF the indication was *accepted*:

14-1 Exit this task.

15 ELSEIF the indication was *postponed*.

15-1 GOTO Wait for Notification.

16 ELSEIF the request resulted in a SMS_CauseCode value of *Destination resource shortage*:

16-1 Exit this task (the MC or OTAF will get no further notification).

17 ELSE (the request was *denied*):

17-1 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).

18 ENDIF.

19 Exit this task.

5 SMS NOTIFICATION

5.1 HLR Initiating SMS Notification

Upon request to send an SMSNotification message, the HLR shall do the following:

1 Include the ElectronicSerialNumber parameter set to the ESN of the desired MS.

2 Include the MSID parameter set to the MIN or IMSI of the desired MS.

3 IF the notification is being issued, for any of the TDMA teleservices, independent of a postponed (previous) SMSRequest to initiate a SMS teleservice on an MS:

3-1 Include the SMSTeleserviceIdentifier parameter set to the teleservice for which the notification is being made.

4 ENDIF.

5 IF MS is denied:

5-1 Include the SMS_AccessDeniedReason parameter set to *Denied*.

6 ELSEIF MS is unavailable or the temporary SMS routing address is not current:

6-1 Include the SMS_AccessDeniedReason parameter set to *Unavailable*.

7 ELSE:

7-1 Include the SMS_Address parameter set to the temporary SMS routing address of the desired MS for SMS, or set to temporary MSC routing address for CDMA OTAPA.

8 ENDIF.

9 Send an SMSNotification message toward the MS's MC, for SMS, or toward the OTAF, for OTAPA.

10 Start the SMS Notification Timer (SNT).

11 WAIT for a SMS Notification response:

12 WHEN a RETURN RESULT is received:

12-1 Stop the timer (SNT).

12-2 IF the message cannot be processed:

12-2-1 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

12-3 ENDIF.

13 WHEN a RETURN ERROR or REJECT is received:

13-1 Stop the timer (SNT).

13-2 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

14 WHEN the timer (SNT) expires:

14-1 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

15 ENDWAIT.

16 Exit this task.

5.2 MSC Initiating SMS Notification

If the availability status of an MS-based SME changes (e.g., when an MS does a sleep mode wake-up registration) while the SMS Delivery Pending Flag is set, the MSC shall do the following:

1 Include the ElectronicSerialNumber parameter set to the ESN of the desired MS.

2 Include the MSID parameter set to the MIN or IMSI of the desired MS.

3 IF terminating SMS access to the MS is denied:

3-1 Include the SMS_AccessDeniedReason parameter set to *Denied*.

4 ELSEIF the MS is unavailable:

4-1 Include the SMS_AccessDeniedReason parameter set to *Unavailable*.

5 ELSE:

5-1 Include the SMS_Address parameter set to the temporary SMS routing address for the desired MS. (The MSC should also do what is necessary to keep the MS awake for some period of time for a possible short message delivery.)

6 ENDIF.

7 Send a SMSNotification message toward the MS's MC.

8 Start the SMS Notification Timer (SNT).

9 WAIT for a SMS Notification response:

10 WHEN a RETURN RESULT is received:

10-1 Stop the timer (SNT).

10-2 IF the message cannot be processed:

10-2-1 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

10-2-2 Exit this task.

10-3 ENDIF.

10-4 IF the received SMS_MessageCount parameter is set to value zero:

10-4-1 Clear the SMS_DeliveryPendingFlag for this MS.

10-5 ENDIF.

11 WHEN a RETURN ERROR or REJECT is received:

11-1 Stop the timer (SNT).

11-2 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

12 WHEN the timer (SNT) expires:

12-1 Execute "Local Recovery Procedures" task (see Part 630, sec. 5.1).

13 ENDWAIT.

14 Exit this task.

5.3 MC or TDMA OTAF Receiving an SMSNotification INVOKE

Upon receipt of a SMSNotification INVOKE, the MC or TDMA OTAF shall do the following:

1 IF the received message can be processed:

1-1 Select the MS based on the received MSID and ElectronicSerialNumber parameters.

1-2 IF the SMS_AccessDeniedReason parameter was received:

1-2-1 Clear the SMS_Address.

1-3 ELSEIF the SMS_Address parameter was received:

1-3-1 Store the SMS_Address as the temporary routing address with the current time.

1-3-2 Optionally, For CDMA OTAPA inform the CSC that the MS, identified by the received MSID and ElectronicSerialNumber parameters, is available.

1-4 ELSE (expected parameters not received):

1-4-1 Send a RETURN ERROR with the Error Code set to *MissingParameter*.

1-4-2 Exit this task.

1-5 ENDIF.

1-6 IF there are no SMS messages pending delivery to the MS identified:

1-6-1 Include the SMS_MessageCount parameter set to value zero.

1-7 ENDIF.

1-8 Send a SMSNotification RETURN RESULT.

1-9 IF messages are queued for delivery to the indicated MSID:

1-9-1 Pass SMSNotification to “MC or OTAF Initiating SMS Delivery Point-To-Point to an MS-Based SME” task (see Part 641, sec. 4.6 “Wait for Notification”).

1-10 ELSE:

1-10-1 Ignore the message.

1-11 ENDIF.

2 ELSE (the received message cannot be processed):

2-1 Send a RETURN ERROR with the proper Error Code value (see the following table).

3 ENDIF.

4 Exit this task.

Table 1 MC or TDMA OTAF SMSNotification Response

Problem Detection and Recommended Response from the MC or TDMA OTAF toward the initiating HLR	
RETURN ERROR Error Code	**PROBLEM DEFINITION**
UnrecognizedMIN	The supplied MobileIdentificationNumber parameter is in the MC’s range of MINs, but no record exists for the MIN. ***Note: This Error Code is not an appropriate OTAF response to an SMSNotification transaction.***

UnrecognizedESN	An MC record exists for the supplied MobileIdentificationNumber parameter, but the supplied ElectronicSerialNumber parameter does not match the ESN in the MC's record (if the MC stores it). ***Note: This Error Code is not an appropriate OTAF response to an SMSNotification transaction.***
ID/HLRMismatch	The supplied MSID parameter is not in the MC's or OTAF's range of MSIDs (suspect routing error).
ResourceShortage	A required MC or OTAF resource (e.g., internal memory record, MC or OTAF is fully occupied) is temporarily not available (e.g., congestion).
OperationNotSupported	The requested MAP operation is recognized, but not supported, by the receiving MC or OTAF, or the requesting functional entity is not authorized. ***Note: It is recommended that an MC & OTAF support SMSNotification transactions.***
ParameterError	A supplied parameter has an encoding problem (e.g., the supplied MobileIdentificationNumber parameter digit values do not meet the BCD specification). ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
SystemFailure	A required resource (e.g., data base access, functional entity) is not presently accessible due to a failure. Human intervention may be required for resolution.
UnrecognizedParameter-Value	A supplied parameter value is unrecognized or has nonstandard values. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
MissingParameter	An expected or required optional parameter (e.g., SMS_AccessDeniedReason, SMS_Address) was not received. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
UnrecognizedIMSI/TMSI	The supplied IMSI parameter is in the MC's range of IMSIs, but no record exists for the IMSI. ***Note: This Error Code is not an appropriate OTAF response to an SMSNotification transaction.***
RETURN RESULT DenyAccess	An MC or OTAF record exists for the supplied MobileIdentificationNumber parameter, but a SMS routing address to the supplied MIN has been permanently denied (e.g., *Delinquent Account*, *Stolen Unit*, *Duplicate Unit*, *Invalid ESN*, *Unassigned directory number*, *Vacation disconnect*).

5.4 CDMA OTAF Receiving an SMSNotification INVOKE

Upon receipt of an SMSNotification INVOKE, the CDMA OTAF shall do the following:

1 IF the received message can be processed:

1-1 IF the SMS_Address parameter was received:

1-1-1 Store the SMS_Address as the temporary routing address with the current time.

1-1-2 Optionally, Inform the CSC that the MS, identified by the received MSID and ElectronicSerialNumber parameters, is available for an OTAPA session.

1-1-3 Send an SMSNotification RETURN RESULT.

1-2 ELSE (expected parameters not received):

1-2-1 Send a RETURN ERROR with the Error Code set to *MissingParameter*.

1-3 ENDIF.

2 ELSE (the received message cannot be processed):

2-1 Send a RETURN ERROR with the proper Error Code value (see the following table).

3 ENDIF.

4 Exit this task.

Table 2 CDMA OTAF SMSNotification Response

Problem Detection and Recommended Response from the CDMA OTAF towards the initiating HLR	
RETURN ERROR Error Code	**PROBLEM DEFINITION**
ID/HLRMismatch	The supplied MSID parameter is not in the OTAF's range of MSIDs (suspect routing error).
ResourceShortage	A required OTAF resource (e.g., internal memory record, OTAF is fully occupied) is temporarily not available (e.g., congestion).
OperationNotSupported	The requested MAP operation is recognized, but not supported, by the receiving OTAF, or the requesting functional entity is not authorized. ***Note: It is recommended that an OTAF supports SMSNotification transactions.***
ParameterError	A supplied parameter has an encoding problem (e.g., the supplied MobileIdentificationNumber parameter digit values do not meet the BCD specification). ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
SystemFailure	A required resource (e.g., data base access, functional entity) is not presently accessible due to a failure. Human intervention may be required for resolution. ***Note: The OTAF did not respond, possibly indicating that it does not support an SMSNotification message.***
MissingParameter	An expected, or required, optional parameter (e.g., SMS_Address) was not received. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***

UnrecognizedParameter-Value	A supplied parameter value is unrecognized or has nonstandard values. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***

6 SMS REQUEST

6.1 MC or OTAF Initiating SMS Request

Upon request to obtain a routing address for an MS-based SME or an OTAPA capable MS (this request may be *accepted*, *postponed*, *unavailable*, or *denied*), the MC or OTAF shall do the following:

1 IF the ESN is known for the MS:

1-1 Include the ElectronicSerialNumber parameter set to identify the MS.

2 ENDIF.

3 Include the MSID parameter set to identify the MS.

4 Include the SMS_TeleserviceIdentifier parameter, if applicable (e.g., TDMA OPTS), set to the appropriate teleservice identifier value if applicable.

5 Include the ServiceIndicator parameter, if applicable (e.g., CDMA OTAPA), set to identify the service for which this SMSRequest is being made.

6 IF notification is not required:

6-1 Include the SMS_NotificationIndicator parameter set to *Do not notify when available*.

7 ENDIF.

8 Send a SMSRequest INVOKE message toward the HLR serving the MS.

9 Start the SMS Request Timer (SRT).

10 WAIT for an SMS Request response:

11 WHEN a RETURN RESULT is received:

11-1 Stop the timer (SRT).

11-2 IF the message can be processed:

11-2-1 IF an SMS_Address is received:

11-2-1-1 Return to the calling task with the SMS_Address and an *accepted* indication.

11-2-2 ELSEIF an SMS_AccessDeniedReason parameter is received:

11-2-2-1 CASE SMS_AccessDeniedReason value OF:

11-2-2-2 *Postponed:*

11-2-2-2-1 Return to the calling task with a *postponed* indication.

11-2-2-3 *Denied*:

11-2-2-3-1 Return to the calling task with a *denied* indication.

11-2-2-4 *Unavailable:*

11-2-2-4-1 Return to the calling task with a *unavailable* indication.

11-2-2-5 ENDCASE:

11-2-3 ELSE the request resulted in a SMS_CauseCode value of *Invalid Teleservice ID:*

11-2-3-1 Exit this task.

11-2-4 ENDIF.

11-3 ELSE (the message cannot be processed):

11-3-1 Return to the calling task with a *denied* indication.

11-4 ENDIF.

12 WHEN a RETURN ERROR or REJECT is received:

12-1 Stop the timer (SRT).

12-2 Return to the calling task with a *denied* indication.

13 WHEN the timer (SRT) expires:

13-1 Return to the calling task with a *denied* indication.

14 ENDWAIT.

15 Exit this task.

6.2 HLR Receiving an SMSRequest INVOKE

Upon receipt of a SMSRequest INVOKE, the HLR shall do the following:

1 IF the message can be processed:

1-1 IF CDMA service:

1-1-1 IF the addressed MS is not known, OR IF the MS is known, but is not authorized for SMS, OR IF the ServiceIndicator parameter is present and its value is not supported by the HLR:

1-1-1-1 Include the SMS_AccessDeniedReason parameter indicating *Denied*.

1-1-1-2 Send a RETURN RESULT.

1-1-1-3 Exit this task.

1-1-2 ENDIF.

1-1-3 IF ServiceIndicator parameter is present and indicates *CDMA OTAPA service*:

1-1-3-1 IF the ElectronicSerialNumber parameter was not received:

1-1-3-1-1 Include the ElectronicSerialNumber parameter set to identify the MS.

1-1-3-2 ENDIF.

1-1-3-3 IF either current serving MSC is not OTAPA capable OR is not secure to program the MS at its current location, OR IF the temporary routing address is not current, OR IF the MS is reported as inactive:

1-1-3-3-1 IF the SMSNotificationIndicator parameter was present in the SMSRequest INVOKE and the SMSNotificationIndicator indicates *Do not notify when available:*

1-1-3-3-1-1 Include the SMSAccessDeniedReason parameter set to *Unavailable*.

1-1-3-3-2 ELSE:

1-1-3-3-2-1 IF the *OTA Delivery Pending Flag* for this MS is not already set:

1-1-3-3-2-1-1 Set the *OTA Delivery Pending Flag* for this MS, storing the routing address of the OTAF from which the SMSRequest INVOKE was received with that flag.

1-1-3-3-2-2 ELSE:

1-1-3-3-2-2-1 Replace the routing address previously stored with the *OTA Delivery Pending Flag* for this MS with the routing address of the OTAF from which the SMSRequest INVOKE was received.

1-1-3-3-2-3 ENDIF.

1-1-3-3-2-4 Include the SMSAccessDeniedReason parameter set to *Postponed*.

1-1-3-3-3 ENDIF.

1-1-3-3-4 Send a RETURN RESULT.

1-1-3-3-5 Exit this task.

1-1-3-4 ELSE:

1-1-3-4-1 Include the SMS_Address parameter set to the current address for the MS.

1-1-3-4-2 Send a RETURN RESULT.

1-1-3-4-3 Exit this task.

1-1-3-5 ENDIF.

1-1-4 ENDIF.

1-1-5 IF the teleservice indicated by the SMS_TeleserviceIdentifier parameter is unknown or is not supported:

1-1-5-1 Include the SMS_AccessDeniedReason parameter indicating *Invalid*:

1-1-6 ENDIF.

1-2 ELSEIF TDMA service:

1-2-1 IF the addressed MS is not known, OR IF the MS is known, but is not authorized for SMS:

1-2-1-1 Include the SMS_AccessDeniedReason parameter set to *Denied*.

1-2-2 ELSEIF (the teleservice indicated by the SMS_TeleserviceIdentifier parameter is unknown or is not supported):

1-2-2-1 Include the SMS_AccessDeniedReason parameter set to *Invalid*.

1-2-3 ELSEIF the SMS_TeleserviceIdentifier is not supported:

1-2-3-1 Include the SMS_CauseCode parameter set to Invalid Teleservice ID.

1-2-4 ENDIF.

1-3 ENDIF.

1-4 IF the temporary SMS routing address is current (as determined by the HLR, e.g., some time between never to until revoked) for the addressed MS:

1-4-1 Include the SMS_Address parameter set to the current SMS address for the MS.

1-4-2 IF the ElectronicSerialNumber parameter was not received:

1-4-2-1 Include the ElectronicSerialNumber parameter set to identify the MS.

1-4-3 ENDIF.

1-5 ELSEIF the addressed MS is able to receive SMS messages (e.g., MS is registered to an SMS capable system), but the SMS address is not current or the MS is reported as inactive:

1-5-1 Relay all parameters received in the SMSRequest INVOKE.

1-5-2 Include the ElectronicSerialNumber parameter for the addressed MS.

1-5-3 Send an SMSRequest INVOKE to the VLR that is currently serving the indicated MS.

1-5-4 Start the SMS Request Timer (SRT).

1-5-5 WAIT for an SMS Request Response.

1-5-6 WHEN a RETURN RESULT is received:

1-5-6-1 Stop timer (SRT).

1-5-6-2 IF the message can be processed:

1-5-6-2-1 Relay all received parameters.

1-5-6-3 ELSE (message cannot be processed):

1-5-6-3-1 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).

1-5-6-3-2 Set the SMS Delivery Pending Flag for this MS.

1-5-6-3-3 Include the SMS_AccessDeniedReason parameter set to *Postponed*.

1-5-6-4 ENDIF.

1-5-7 WHEN a RETURN ERROR or REJECT is received:

1-5-7-1 Stop timer (SRT).

1-5-7-2 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).

1-5-7-3 Set the SMS Delivery Pending Flag for this MS.

1-5-7-4 Include the SMS_AccessDeniedReason parameter set to *Postponed*.

1-5-8 WHEN timer (SRT) expires:

1-5-8-1 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).

1-5-8-2 Set the SMS Delivery Pending Flag for this MS.

1-5-8-3 Include the SMS_AccessDeniedReason parameter set to *Postponed*.

1-5-9 ENDWAIT.

1-6 ELSE (the MS is not registered to an SMS capable system or the MS is registered to an SMS incapable system):

1-6-1 IF the SMS_NotificationIndicator parameter was present in the SMSRequest INVOKE and the SMS_NotificationIndicator indicates *Do not notify when available*:

1-6-1-1 Include the SMS_AccessDeniedReason parameter set to *Unavailable*.

1-6-2 ELSE:

1-6-2-1 Set the *SMS Delivery Pending Flag* for this MS

1-6-2-2 Include the SMS_AccessDeniedReason parameter set to *Postponed*.

1-6-3 ENDIF.

1-7 ENDIF.

1-8 Send a RETURN RESULT.

2 ELSE (message cannot be processed):

2-1 Include the Error Code parameter set to the proper value (see the following table).

2-2 Send a RETURN ERROR.

3 ENDIF.

4 Exit this task.

Table 3 HLR SMSRequest Response

Problem Detection and Recommended Response from the HLR towards the requesting MC	
RETURN ERROR Error Code	**PROBLEM DEFINITION**
UnrecognizedMIN	The supplied MobileIdentificationNumber parameter is within the HLR’s range of MINs, but no record exists.
UnrecognizedESN	An HLR record exists for the supplied MSID parameter, but the ElectronicSerialNumber parameter supplied does not match the stored value.
ID/HLRMismatch	The supplied MSID parameter is not in the HLR’s range of MSIDs or the supplied MDN parameter is not in the HLR’s range of MDNs. (suspect routing error).
ResourceShortage	A required HLR resource (e.g., internal memory record, HLR is fully occupied) is temporarily not available (e.g., congestion).
OperationNotSupported	The requested MAP operation is recognized, but not supported, by the receiving HLR, or the requesting functional entity is not authorized. ***Note: It is recommended that a HLR support SMSRequest transactions. This response may have been originated by the serving system.***

ParameterError	A supplied parameter has an encoding problem (e.g., the supplied MobileIdentificationNumber parameter digit values do not meet the BCD specification). ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
SystemFailure	A required resource (e.g., data base access, functional entity) is not presently accessible due to a failure. Human intervention may be required for resolution. ***Note: This response may have been originated by the serving system.***
UnrecognizedParameter-Value	A supplied parameter value is unrecognized or has nonstandard values. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
MissingParameter	An expected, or required, optional parameter (e.g., SMS_NotificationIndicator) was not received. The HLR has activity for the supplied MSID parameter that requires the ElectronicSerialNumber parameter to be supplied before a SMSRequest transaction can be successfully completed, the ElectronicSerialNumber parameter was not supplied. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
UnrecognizedIMSI/TMSI	The supplied IMSI parameter is within the HLR's range of IMSIs, but no record exists.
RETURN RESULT SMS_AccessDeniedReason	***Note: Only RETURN RESULT operations needing clarification have been included.***
Denied	An HLR record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been permanently denied (e.g., *Delinquent Account*, *Stolen Unit*, *Duplicate Unit*, *Invalid ESN*, *Unassigned directory number*, *Vacation disconnect*); avoid future SMS transactions to the supplied MSID (ESN).
Postponed	An HLR record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been temporarily denied (e.g., no routing address, MS is busy, MS is not registered, No Page Response, MS is unavailable, MS is inactive, other temporary SMS delivery trouble). Also when the Serving VLR (or other functional entity) responded *OperationNotSupported* or did not respond. The HLR will notify the requesting MC when SMS delivery to the supplied MSID can be resumed.
Unavailable	An HLR record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been temporarily denied (e.g., no routing address, MS is busy, MS is not registered, No Page Response, MS is unavailable, MS is inactive, other temporary SMS delivery trouble). Also when the Serving VLR (or other functional entity) responded *OperationNotSupported* or did not respond. The HLR will not notify the requesting MC when SMS delivery to the supplied MSID can be resumed.
Invalid	The teleservice indicated by the SMS_TeleserviceIdentifier parameter is unknown or is not supported.

6.3 VLR Receiving an SMSRequest INVOKE

Upon receipt of an SMSRequest INVOKE, the VLR shall perform the following:

1 IF the received message can be processed:
1-1 Relay all received parameters.
1-2 Send a SMSRequest INVOKE to the MSC that is currently serving the indicated MS.
1-3 Start the SMS Request Timer (SRT).
1-4 WAIT for a SMS Request Response.
1-5 WHEN a RETURN RESULT is received:
1-5-1 Stop timer (SRT).
1-5-2 IF the message is valid:
1-5-2-1 Relay all received parameters.
1-5-2-2 Send a RETURN RESULT to the HLR.
1-5-3 ELSE (message is not valid):
1-5-3-1 Send a RETURN ERROR with Error Code *SystemFailure*.
1-5-3-2 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).
1-5-4 ENDIF.
1-6 WHEN a RETURN ERROR is received:
1-6-1 Stop timer (SRT).
1-6-2 CASE Error Code OF:
1-6-3 *ParameterError*:
1-6-3-1 Send a RETURN ERROR with Error Code *ParameterError*.
1-6-4 *OperationSequenceProblem*:
1-6-4-1 Send a RETURN ERROR with Error Code *OperationSequenceProblem*.
1-6-5 *DEFAULT*:
1-6-5-1 Send a RETURN ERROR with Error Code *SystemFailure*.
1-6-6 ENDCASE.
1-6-7 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).
1-7 WHEN a REJECT is received:
1-7-1 Stop timer (SRT).
1-7-2 Send a RETURN ERROR with Error Code set to indicate *SystemFailure*.
1-7-3 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).
1-8 WHEN timer (SRT) expires:
1-8-1 Send a RETURN ERROR with Error Code *SystemFailure*.
1-8-2 Execute “Local Recovery Procedures” task (see Part 630, sec. 5.1).
1-9 ENDWAIT.
2 ELSE (the received message cannot be processed):
2-1 Send a RETURN ERROR with the proper Error Code value (see the following table).
3 ENDIF.
4 Exit this task.

Table 4 VLR SMSRequest Response

Problem Detection and Recommended Response from the VLR to the requesting HLR	
RETURN ERROR Error Code	**PROBLEM DEFINITION**
UnrecognizedMIN	A VLR record does not presently exists for the supplied MobileIdentificationNumber parameter. (The HLR should remove its pointer to the VLR.)
UnrecognizedESN	A VLR record exists for the supplied MSID parameter, but the supplied ElectronicSerialNumber parameter does match the stored value.
ResourceShortage	A required VLR resource (e.g., internal memory record, VLR is fully occupied) is temporarily not available (e.g., congestion).
OperationNotSupported	The requested MAP operation is recognized, but not supported, by the receiving VLR, or the requesting functional entity is not authorized. ***Note: It is recommended that a VLR supports SMSRequest transactions.***
ParameterError	A supplied parameter has an encoding problem (e.g., the supplied MobileIdentificationNumber parameter digit values do not meet the BCD specification). ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
SystemFailure	A required resource (e.g., data base access, functional entity) is not presently accessible due to a failure. Human intervention may be required for resolution.
UnrecognizedParameter-Value	A supplied parameter value is unrecognized or has nonstandard values. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
MissingParameter	An expected, or required, optional parameter (e.g., ElectronicSerialNumber, SMS_NotificationIndicator) was not received. Include the Parameter Identifier in question as the FaultyParameter parameter.
UnrecognizedIMSI/TMSI	A VLR record does not presently exists for the supplied IMSI parameter. (The HLR should remove its pointer to the VLR.)
RETURN RESULT SMS_AccessDeniedReaon	***Note: Only RETURN RESULT operations needing clarification have been included.***
Denied	A VLR record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI is permanently denied (e.g., *Delinquent Account*, *Stolen Unit*, *Duplicate Unit*, *Invalid ESN*, *Unassigned directory number*, *Vacation disconnect*); avoid future SMS transactions to the supplied MSID (ESN).

Postponed	A VLR record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been temporarily denied (e.g., no routing address, MS is busy, MS is not registered, no page response, MS is unavailable, MS is inactive, other temporary SMS delivery trouble). Also when the Serving MSC (or other functional entity) responded *OperationNotSupported* or did not respond. The VLR will notify the requesting HLR when SMS delivery to the supplied MSID can be resumed.
Unavailable	A VLR record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been temporarily denied (e.g., no routing address, MS is busy, MS is not registered, No Page Response, MS is unavailable, MS is inactive, other temporary SMS delivery trouble). Also when the Serving MSC (or other functional entity) responded *OperationNotSupported* or did not respond. The VLR will not notify the requesting HLR when SMS delivery to the supplied MSID can be resumed.

6.4 MSC Receiving an SMSRequest INVOKE

Upon receipt of an SMSRequest INVOKE, the MSC shall perform the following:

1 IF the received message can be processed:

1-1 IF the MSC is not capable of supporting SMS:

1-1-1 Include the SMS_AccessDeniedReason parameter set to *Unavailable*.

1-2 ELSEIF the MS is not capable or authorized for SMS:

1-2-1 Include the SMS_AccessDeniedReason parameter set to *Denied*.

1-3 ELSEIF the MS is in a state, operation mode, and location where it can receive SMS messages:

1-3-1 Optionally, take action to keep the MS in a mode capable of receiving SMS messages.

1-3-2 Include the SMS_Address parameter set to reflect the address to be used to deliver SMS messages for the indicated MS.

1-4 ELSE (MS can receive SMS messages, but not right now):

1-4-1 IF the SMS_NotificationIndicator parameter was received and the SMS_NotificationIndicator indicates *Do not notify when available*:

1-4-1-1 Include the SMS_AccessDeniedReason parameter set to *Unavailable*.

1-4-2 ELSE (notification was requested):

1-4-2-1 Set the *SMS Delivery Pending Flag* for this MS.

1-4-2-2 Include the SMS_AccessDeniedReason parameter set to *Postponed*.

1-4-3 ENDIF.

1-5 ENDIF.

1-6 Include the MSID parameter set to the type of mobile station identifier needed for SMS delivery.

1-7 Send a RETURN RESULT to the requesting VLR.

2 ELSE (the received message cannot be processed):

2-1 Send a RETURN ERROR with the proper Error Code value (see the following table).

3 ENDIF.

4 Exit this task.

Table 5 MSC SMSRequest Response

Problem Detection and Recommended Response from the MSC to the requesting VLR	
RETURN ERROR Error Code	**PROBLEM DEFINITION**
UnrecognizedMIN	The MSC does not presently have a record for the supplied MobileIdentificationNumber parameter. (The VLR should remove its pointer to the MSC.)
UnrecognizedESN	An MSC record exists for the supplied MSID parameter, but the supplied ElectronicSerialNumber parameter does match the stored value.
ResourceShortage	A required MSC resource (e.g., internal memory record, HLR is fully occupied) is temporarily not available (e.g., congestion).

OperationNotSupported	The requested MAP operation is recognized, but not supported, by the receiving MSC, or the requesting functional entity is not authorized. ***Note: It is recommended that an MSCs support SMSRequest transactions.***
ParameterError	A supplied parameter has an encoding problem (e.g., the supplied MobileIdentificationNumber parameter digit values do not meet the BCD specification). ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
SystemFailure	A required resource (e.g., data base access, functional entity) is not presently accessible due to a failure. Human intervention may be required for resolution.
UnrecognizedParameter-Value	A supplied parameter value is unrecognized or has nonstandard values. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
MissingParameter	An expected, or required, optional parameter (e.g., ElectronicSerial-Number, SMS_NotificationIndicator) was not received. ***Note: Include the Parameter Identifier in question as the FaultyParameter parameter.***
UnrecognizedIMSI/TMSI	The MSC does not presently have a record for the supplied IMSI parameter. (The VLR should remove its pointer to the MSC.)
RETURN RESULT SMS_AccessDeniedReaon	***Note: Only RETURN RESULT operations needing clarification have been included.***
Denied	An MSC record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been permanently denied (e.g., *Delinquent Account*, *Stolen Unit*, *Duplicate Unit*, *Invalid ESN*, *Unassigned directory number*, *Vacation disconnect*); avoid future SMS transactions to the supplied MSID.
Postponed	An MSC record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been temporarily denied (e.g., no routing address, MS is busy, MS is not registered, No Page Response, MS is unavailable, MS is inactive, other temporary SMS delivery trouble). The MSC will notify the VLR when SMS delivery to the supplied MSID can be resumed.
Unavailable	An MSC record exists for the supplied MSID parameter, but a SMS routing address to the supplied MIN or IMSI has been temporarily denied (e.g., no routing address, MS is busy, MS is not registered, No Page Response, MS is unavailable, MS is inactive, other temporary SMS delivery trouble). The MSC will not notify the VLR when SMS delivery to the supplied MSID can be resumed.