

3GPP TSG_CN#7
ETSI SMG3 Plenary Meeting #7,
Madrid, Spain
13th – 15th March 2000

NP-000183

Agenda item:

Source: TSG CN WG2

Title: CRs to 3G Work Item CAMEL Phase 3 related to User Interaction during Monitoring State

Introduction:

This document contains 3 CRs on **User Interaction during Monitoring** for **CAMEL Phase 3**.

TDoc	SPEC	CR	REV	CAT	Rel	Old vers	New vers	SUBJECT
N2B000294	23.018	028	1	C	R99	3.3.0		User interaction in Monitoring state
N2A000270	23.078	122	1	F	R99	3.3.0		User Interaction in Monitoring
N2A000228	29.078	058		F	R99	3.2.0		User Interaction in Monitoring

CHANGE REQUEST			
23.018	CR	028r1	Current Version: 3.3.0
For submission to: CN#07	for approval	<input checked="" type="checkbox"/>	strategic <input type="checkbox"/>
	for information	<input type="checkbox"/>	non-strategic <input checked="" type="checkbox"/>

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

Source: N2 **Date:** 11-02-2000

Subject: User interaction in Monitoring state

Work item: CAMEL Phase 3

Category:	F Correction <input type="checkbox"/> A Corresponds to a correction in an earlier release <input type="checkbox"/> B Addition of feature <input checked="" type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	Release:	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input checked="" type="checkbox"/> Release 00 <input type="checkbox"/>
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Reason for change: The Camel Phase 3 standards 22.078, 23.078 and 29.078 specify the behaviour when the gsmSCF performs User Interaction while the call is in Monitoring state.

It shall be possible for the SCP to order User Interaction in the following three cases:

1. During state 'Wait_for_Clear' in process 'OG_Call_Setup_MSC' (during mobile originated calls in the VMSC)
See section 7.1, sheet 9 (new)
2. During state 'Wait_for_Clear' in process 'MT_GMSC' (during mobile terminated calls in the GMSC)
See section 7.2, sheet 8 (new)
3. During state 'Wait_for_Clear' in process 'ICH_MSC' (during mobile terminated calls in the VMSC)
See section 7.3, sheet 14 (new)

The present CR introduces the necessary modifications to 23.018.

Clauses affected: 7.1, 7.2, 7.3

Other specs affected:	Other 3G core specifications <input type="checkbox"/> → List of CRs: Other GSM core specifications <input type="checkbox"/> → List of CRs: MS test specifications <input type="checkbox"/> → List of CRs: BSS test specifications <input type="checkbox"/> → List of CRs: O&M specifications <input type="checkbox"/> → List of CRs:
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Other comments: A set of contributions on the same issue, to 3G TS 23.078 and 3G TS 29.078 will be submitted to the 3GPP-CN2A ad hoc meeting, 21 February 2000.

***** First Modified Section *****

7.1 MO call

7.1.1 Functional requirements of serving MSC

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7.1.1.3 Procedure OG_Call_Setup_MSC

Sheet 1: the variables Alerting sent, MS connected and Reconnect are global data, accessible to the procedures CCBS_Check_OG_Call, CCBS_OCH_Report_Failure, CCBS_OCH_Report_Success, CCBS_Check_If_CCBS_Possible, Send_Alerting_If_Required and Send_Access_Connect_If_Required.

Sheet 1: the VMSC converts the GSM bearer capability negotiated between the VMSC and the MS to a GSM basic service according to the rules defined in GSM 07.01 **[Error! Reference source not found.]**.

Sheet 1: the variable UUS1 result sent is specific to UUS. This variable is accessible to all UUS specific procedures.

Sheet 1: the procedure UUS_OCH_Check_Setup is specific to UUS; it is specified in GSM 03.87 **[Error! Reference source not found.]**.

Sheet 1, sheet 2, sheet 5: the procedure CCBS_OCH_Report_Failure is specific to CCBS; it is specified in GSM 03.93 **[Error! Reference source not found.]**.

Sheet 1, sheet 5, sheet 6, sheet 8: at any stage after the Setup has been received, the MS may terminate the transaction with the network by sending a Release transaction request.

Sheet 2: the procedure Set_CLI_Presentation_Indicator_MSC is specific to CLIR. If the VMSC does not support CLIR, processing continues from the "Yes" exit of the test "Result=Call allowed?".

Sheet 2: the procedure CAMEL_OCH_MSC_INIT is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 **[Error! Reference source not found.]** and GSM 03.78 for CAMEL Phase 2 **[Error! Reference source not found.]**. If the VMSC does not support CAMEL, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 2: the procedure CAMEL_MO_Dialled_Services is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 **[Error! Reference source not found.]**. If the VMSC does not support CAMEL phase 3, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 2: the procedure CCBS_Check_OG_Call is specific to CCBS; it is specified in GSM 03.93 **[Error! Reference source not found.]**. If the VMSC does not support CCBS, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 2: the procedure MOBILE_NUMBER_PORTABILITY_IN_OQoD is specific to Mobile Number Portability; it is specified in GSM 03.66 **[Error! Reference source not found.]**.

Sheet 2: the procedure UUS_OCH_Set_Info_In_IAM is specific to UUS; it is specified in GSM 03.87 **[Error! Reference source not found.]**.

Sheet 2: the procedure CAMEL_Store_Destination_Address is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 **[Error! Reference source not found.]**.

Sheet 3: the procedure CCBS_OCH_Report_Success is specific to CCBS; it is specified in GSM 03.93 **[Error! Reference source not found.]**.

Sheet 3, sheet 6: the procedures CAMEL_Start_TNRy and CAMEL_Stop_TNRy are specific to CAMEL phase 2; they are specified in GSM 03.78 for CAMEL Phase 2 **[Error! Reference source not found.]**.

Sheet 3: the task "UTU2Cnt := 0" is executed only if the VMSC supports UUS

Sheet 4: the procedure CAMEL_OCH_MSC_ANSWER is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 4: the procedure Set_COLP_Info_MSC is specific to COLP.

Sheet 4: the procedure Handle_AoC_MO_MSC is specific to AoC.

Sheet 4: the task "Store CW treatment indicator for this call if received in SII2" is executed only if the VMSC supports CAMEL phase 3.

Sheet 5: the procedures CCBS_Check_If_CCBS_Possible and CCBS_Activation_MSC are specific to CCBS; they are specified in GSM 03.93 [**Error! Reference source not found.**]. The task "Store CCBS Result" is executed only if the VMSC supports CCBS. If the VMSC does not support CCBS, processing continues from the "CCBS Not Possible" exit of the test "CCBS Result".

Sheet 5, sheet 6: the procedures CAMEL_OCH_MSC_DISC3 and CAMEL_OCH_MSC_DISC4 are specific to CAMEL; they are specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**] respectively.

Sheet 5, sheet 6: the procedure CAMEL_OCH_MSC1 is specific to CAMEL phase 2; it is specified in GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL phase 2, processing continues from the "No" exit of the test "Result=Reconnect?"

Sheet 5, sheet 6, sheet 8: the processing in the branch beginning with the Int_Release_Call input will occur only if the MSC supports CAMEL.

Sheet 6, sheet 8: the procedure UUS_MSC_Check_UUS1_UI is specific to UUS; it is specified in GSM 03.87 [**Error! Reference source not found.**].

Sheet 7: the input signal TNrY expired and all the subsequent processing are specific to CAMEL phase 2, and will occur only if the VMSC supports CAMEL phase 2. The procedure CAMEL_OCH_MSC2 is specified in GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**].

Sheet 7: the input signal User To User is specific to UUS; it is discarded if the VMSC does not support UUS.

Sheet 7: the procedures UUS_MSC_Check_UUS2_UI_to_MS and UUS_MSC_Check_UUS2_UI_to_NW are specific to UUS; they are specified in GSM 03.87 [**Error! Reference source not found.**].

Sheet 8: the procedure CAMEL_OCH_MSC_DISC1 is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL, processing continues from the "No" exit of the test "Result=CAMEL handling?".

Sheet 8: the procedure CAMEL_OCH_MSC_DISC2 is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL, processing continues from the "No" exit of the test "Result=CAMEL handling?".

Sheet 9: When the MSC is in state 'Wait_for_Clear', it may receive signals 'Int_Connect_To_Resource' and 'Int_Establish_Temporary_Connection' from process gsmSSF (defined in 3G TS 23.078 [28]). The procedures CAMEL_CF_CTR and CAMEL_CF_ETC are defined in 3G TS 23.078 [28]. When these procedures are called in gsmSSF Monitoring state, the gsmSCF is only allowed to send operation PlayAnnouncement to the gsmSRF. The gsmSCF is not allowed to send operation Prompt&Collect.

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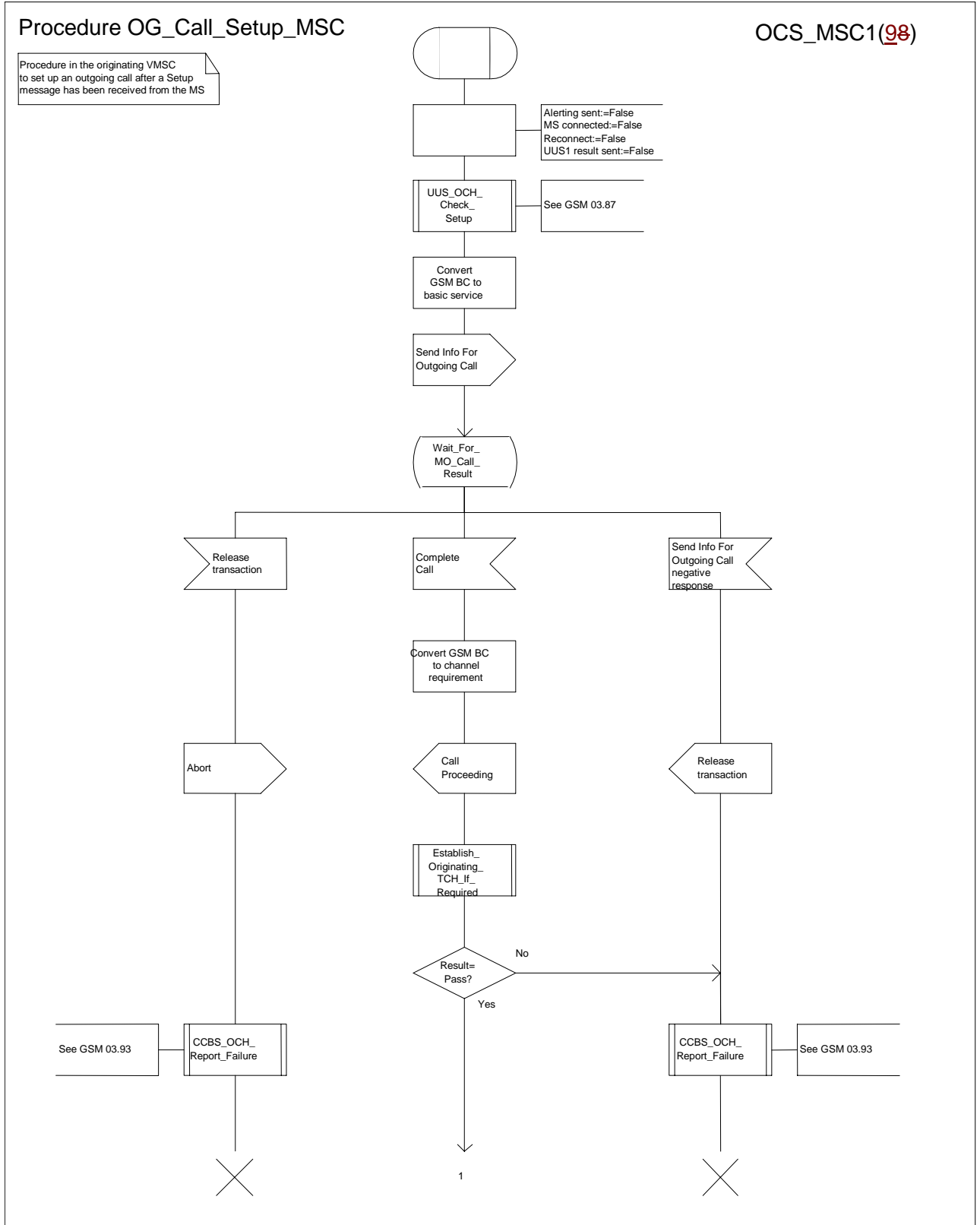


Figure 8a: Procedure Outgoing_Call_Setup_MSC (sheet 1)

Procedure OG_Call_Setup_MSC

OCS_MSC2(98)

Procedure in the originating VMSC to set up an outgoing call after a Setup message has been received from the MS

Signals to/from the left are to/from the BSS; signals to/from the right are to/from the destination exchange.

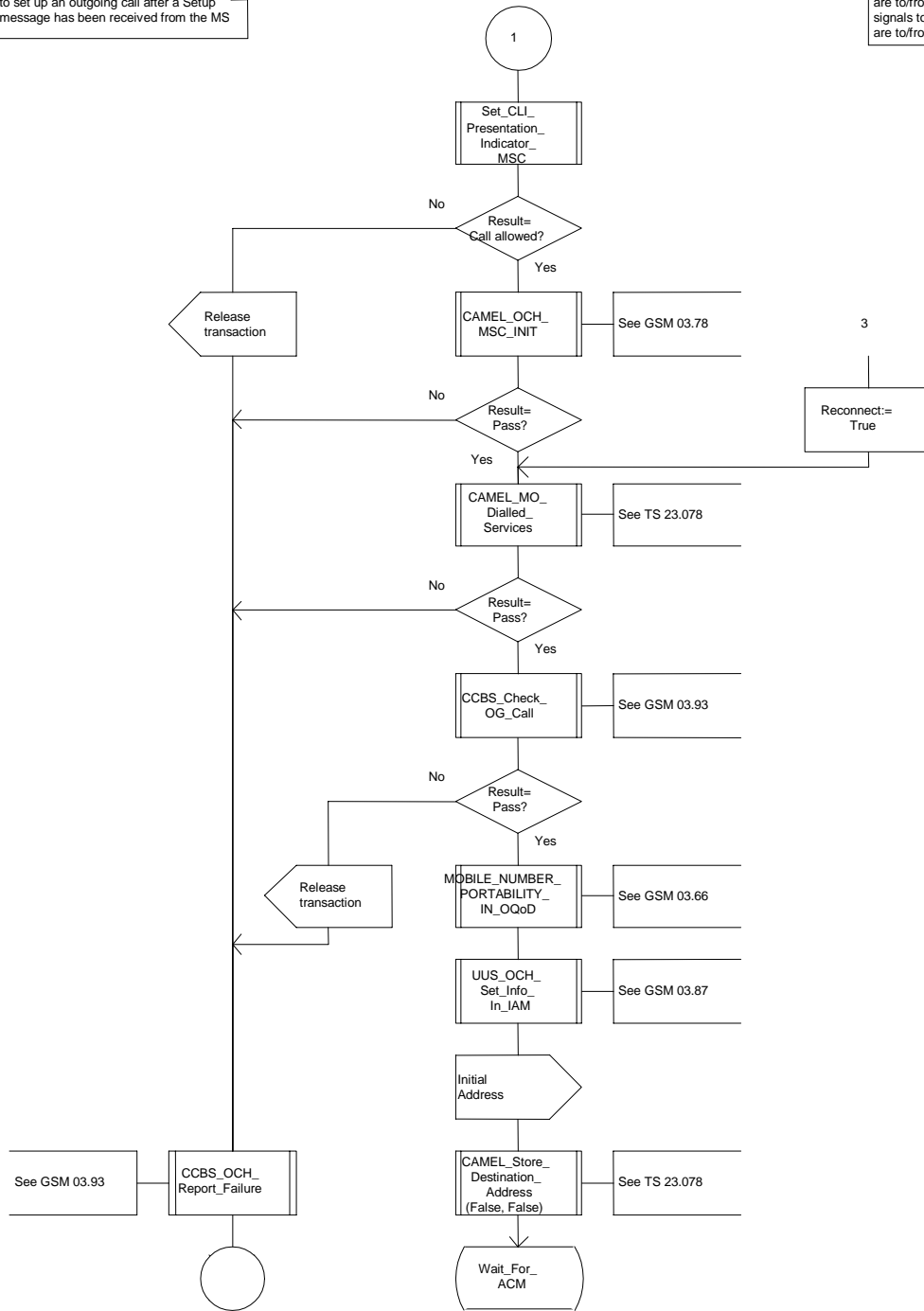


Figure 8b: Procedure Outgoing_Call_Setup_MSC (sheet 2)

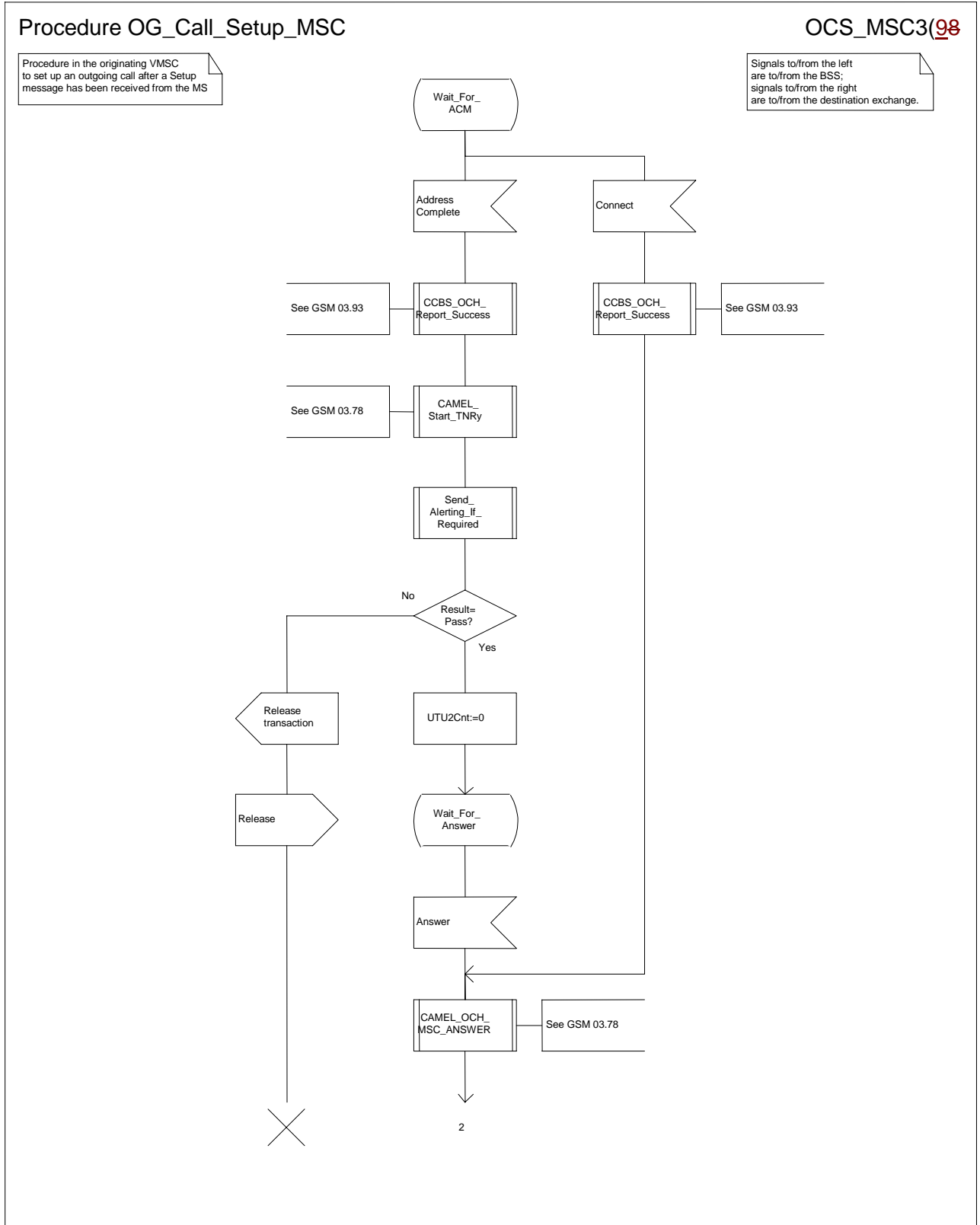


Figure 8c: Procedure Outgoing_Call_Setup_MSC (sheet 3)

Procedure OG_Call_Setup_MSC

OCS_MSC4(98)

Procedure in the originating VMSC to set up an outgoing call after a Setup message has been received from the MS

Signals from the left are from the BSS

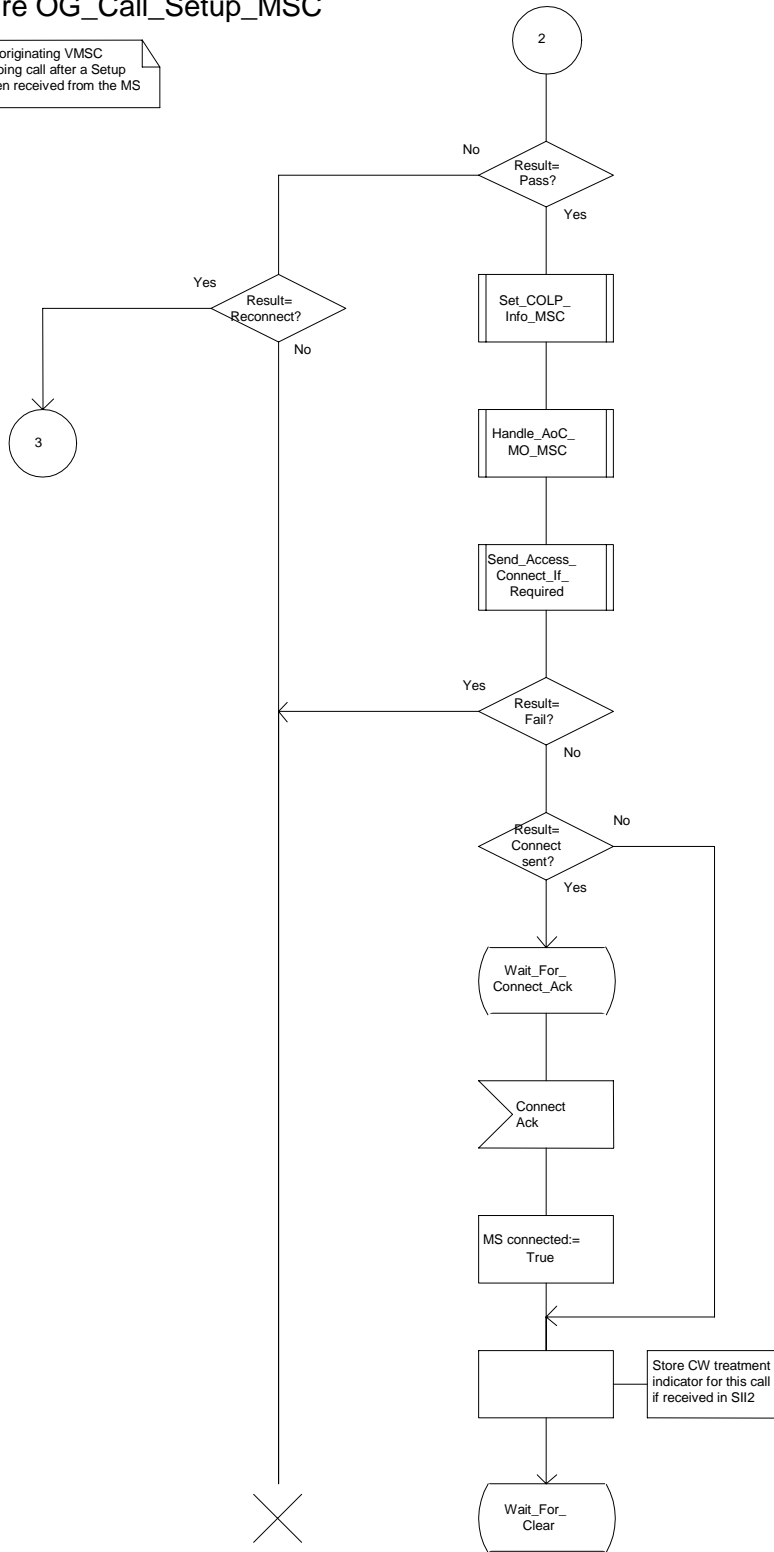


Figure 8d: Procedure Outgoing_Call_Setup_MSC (sheet 4)

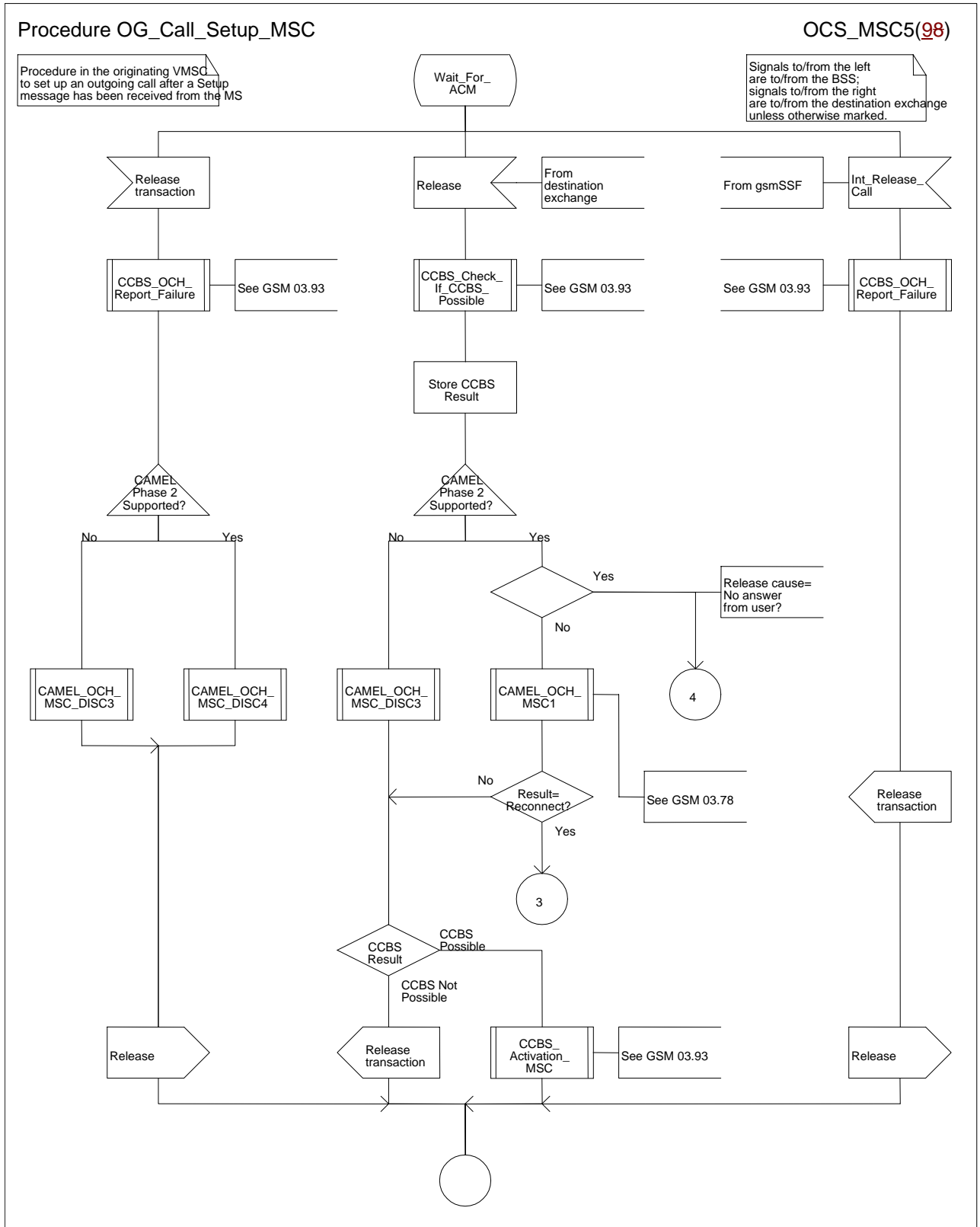


Figure 8e: Procedure Outgoing_Call_Setup_MSC (sheet 5)

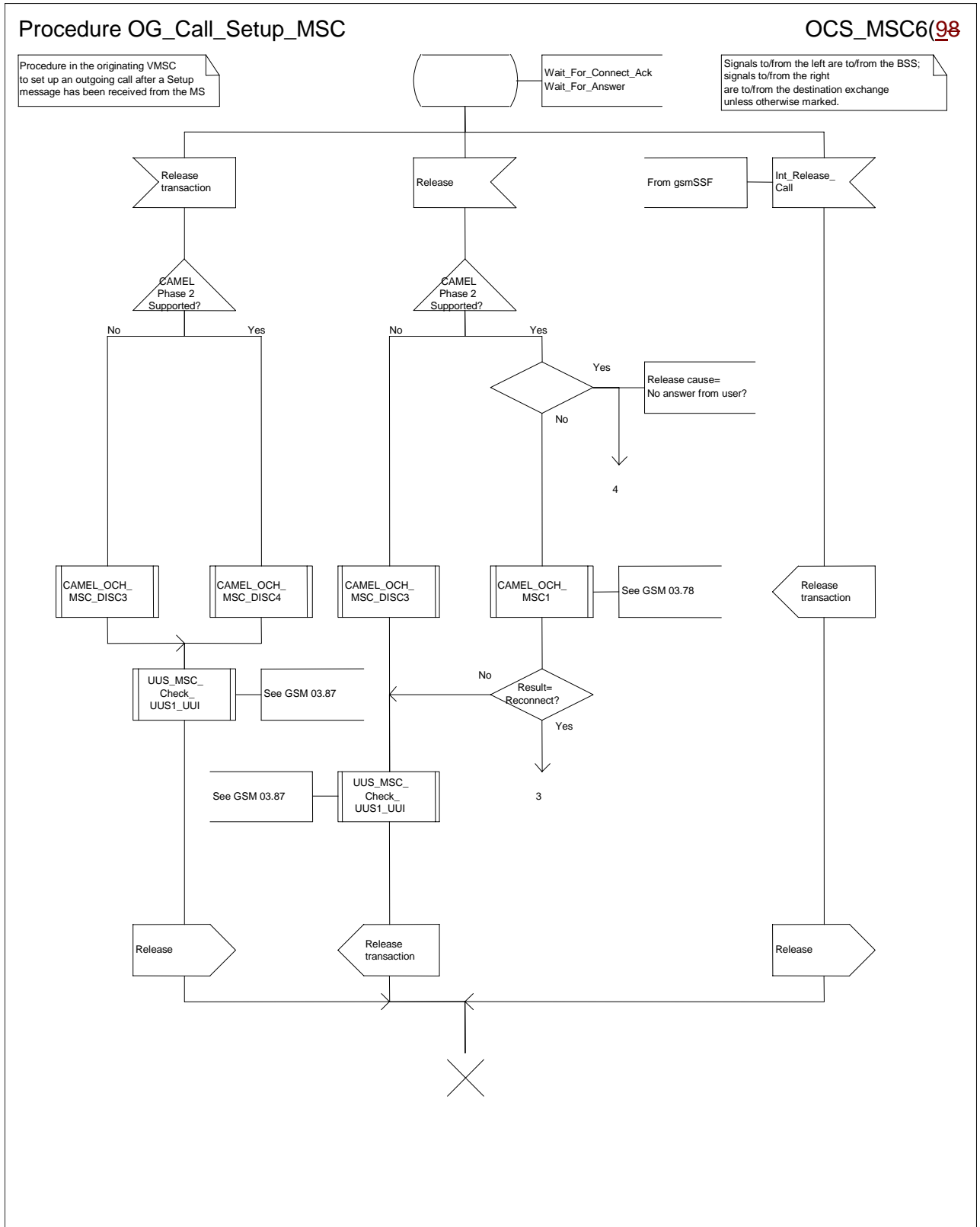


Figure 8f: Procedure Outgoing_Call_Setup_MSC (sheet 6)

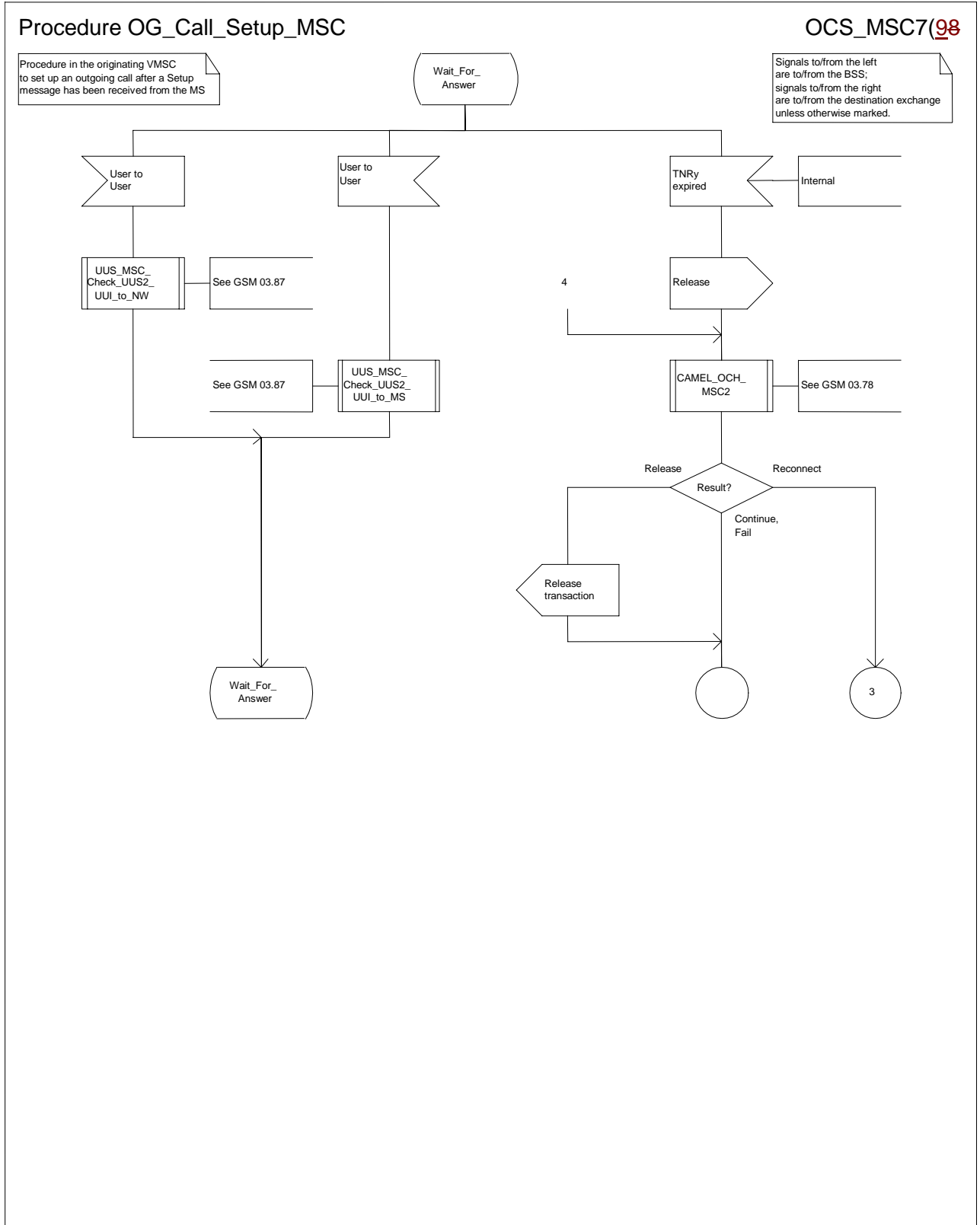


Figure 8g: Procedure Outgoing_Call_Setup_MSC (sheet 7)

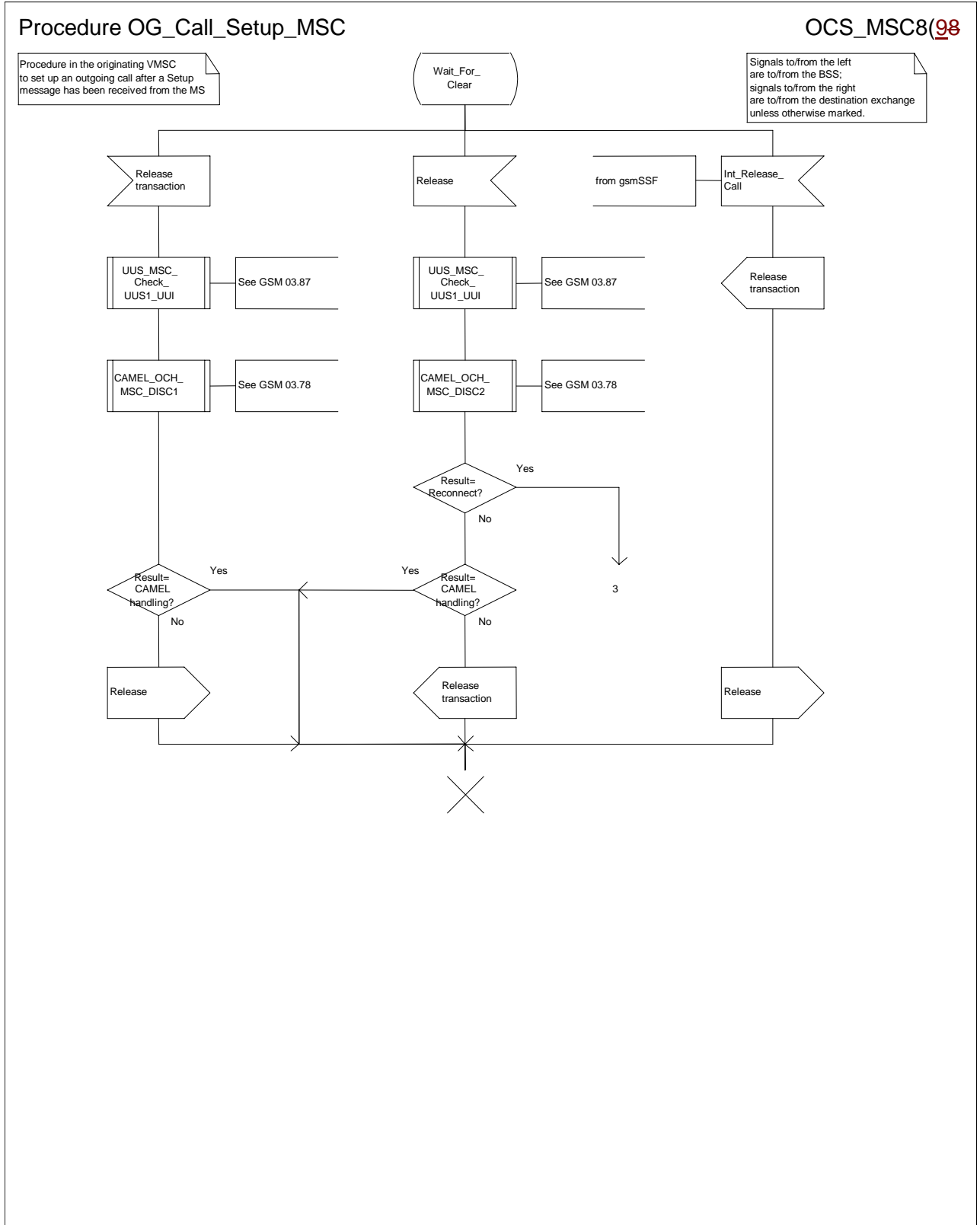


Figure 8h: Procedure Outgoing_Call_Setup_MSC (sheet 8)

Procedure OG_Call_Setup_MSC

OCS_MSC9(9)

Procedure in the originating VMSC to set up an outgoing call after a Setup message has been received from the MS

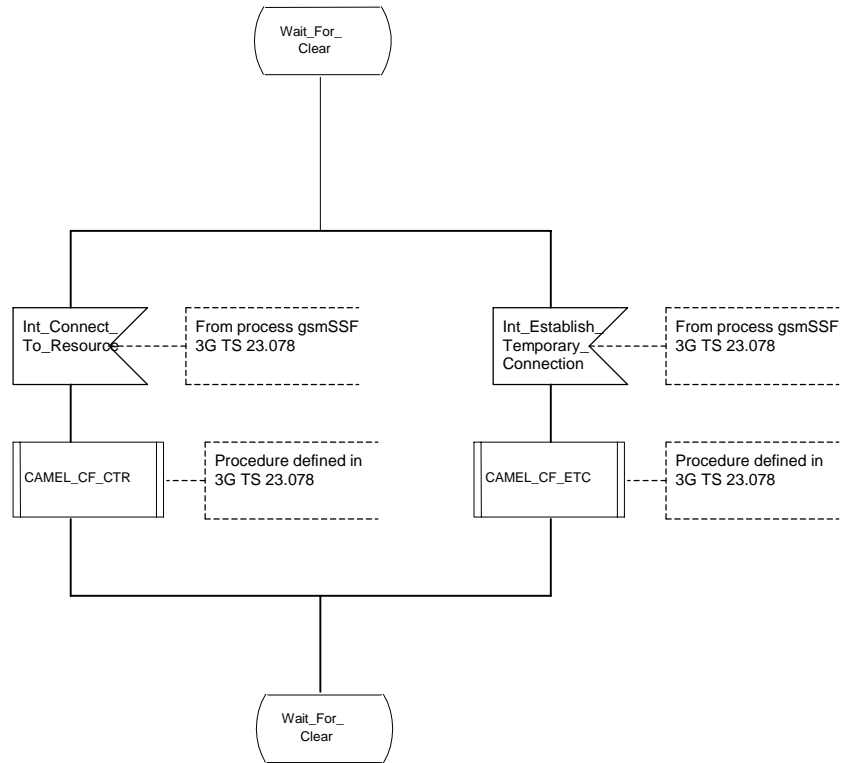


Figure 8i: Procedure Outgoing Call Setup MSC (sheet 9)

7.2 Retrieval of routing information for MT call

7.2.1 Functional requirements of GMSC

7.2.1.1 Process MT_GMSC

Sheet 1: the variables ACM sent, Answer sent, Network connect sent, Reconnect and Resume call are global data, accessible to the procedures CCBS_MT_GMSC_Check_CCBS Possible, CCBS_Set_Diagnostic_For_Release, Obtain_Routing_Address, Send_ACM_If_Required, Send_Answer_If_Required and Send_Network_Connect_If_Required.

Sheet 1: the variable UUS CF interaction is specific to UUS; it is accessible to all UUS specific procedures in the GMSC.

Sheet 1: the procedure OR_Set_ORA_Parameters is specific to Support of Optimal Routing; it is specified in GSM 03.79 [**Error! Reference source not found.**].

Sheet 1: the procedure CAMEL_Set_ORA_Parameters is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**].

Sheet 1: the parameters "Reference address", "OR" and "Own PLMN" are passed to the procedure Obtain_Routing_Address only if the GMSC supports Optimal Routing. The parameter "Destination address" is returned by the procedure Obtain_Routing_Address only if the GMSC supports Optimal Routing of mobile-to-mobile calls. The Send Routing Info negative response information element received in the execution of the procedure Obtain_Routing_Address is global data, available to the parent process.

Sheet 1: the suggested mapping from values of the Send Routing Info negative response information element to values of the ISUP release cause (see ITU-T Recommendation Q.850 [**Error! Reference source not found.**]) is shown in table 1. The mapping used is a matter for the network operator, depending on the telephony signalling system used.

Table 1: Suggested mapping of Send Routing Info (SRI) negative responses to ISUP release causes

SRI negative response	ISUP release cause number	ISUP release cause name
Absent subscriber	20	Subscriber absent
Bearer service not provisioned	57	Bearer capability not authorised
Call barred (ODB)	21	Call rejected
Call barred (SS barring)	21	Call rejected
CUG reject (Called party SS interaction violation)	21	Call rejected
CUG reject (Incoming calls barred within CUG)	55	Incoming calls barred within CUG
CUG reject (Subscriber not member of CUG)	87	User not member of CUG
CUG reject (Requested basic service violates CUG constraints)	87	User not member of CUG
Data missing	111	Protocol error, unspecified
Facility not supported	69	Requested facility not implemented
Forwarding violation	21	Call rejected
Number changed	22	Number changed
System failure	111	Protocol error, unspecified
Teleservice not provisioned	57	Bearer capability not authorised
Unexpected data value	111	Protocol error, unspecified
Unknown subscriber	1	Unallocated (unassigned) number

Sheet 1: it is an operator option whether to send an Address Complete message if the Number Portability Database returns a routing number. If the GMSC sends an Address Complete message, it shall include the called party's status field of the Backward call indicator set to "no indication".

Sheet 1: the called party address sent in the IAM to the process MT_CF_MSC is the Forwarded-to number received in the Perform Call Forwarding ack.

Sheet 1: the procedure CAMEL_Store_Destination_Address is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**].

Sheet 1: it is an operator option whether to send an Address Complete message if the HLR returns forwarding information. If the GMSC sends an Address Complete message, it shall include the called party's status field of the Backward call indicator set to "no indication".

Sheet 2: the procedures CAMEL_Start_TNRy and CAMEL_Stop_TNRy are specific to CAMEL phase 2; they are specified in GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**].

Sheet 2, sheet 3: the procedure CAMEL_MT_GMSC_ANSWER is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the GMSC does not support CAMEL, processing continues from the "Pass" exit of the test "Result".

Sheet 2, sheet 3: the task "Set destination address parameter" is executed only if the GMSC supports Optimal Routing of mobile-to-mobile calls.

Sheet 3: the procedure Handle_COLP_Forwarding_Interaction is specific to COLP.

Sheet 4: the input signal Resume Call Handling and all the subsequent processing on this sheet are specific to Support of Optimal Routing, and will occur only if the GMSC supports Optimal Routing. The procedure OR_Handle_RCH is specified in GSM 03.79 [**Error! Reference source not found.**].

Sheet 4, sheet 6: the procedure CCBS_MT_GMSC_Check_CCBS_Possible is specific to CCBS; it is specified in GSM 03.93 [**Error! Reference source not found.**].

Sheet 5: the input signal TNRy expired and all the subsequent processing are specific to CAMEL phase 2, and will occur only if the GMSC supports CAMEL phase 2. The procedure CAMEL_MT_GMSC_DISC5 is specified in GSM 03.78 for CAMEL phase 2 [**Error! Reference source not found.**].

Sheet 6: the procedures CAMEL_MT_GMSC_DISC3, CAMEL_MT_GMSC_DISC4 and CAMEL_MT_GMSC_DISC6 are specific to CAMEL; they are specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] (CAMEL_MT_GMSC_DISC3) and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**] (CAMEL_MT_GMSC_DISC4 and CAMEL_MT_GMSC_DISC6)..

Sheet 6: the procedure CCBS_Set_Diagnostic_For_Release is specific to CCBS; it is specified in GSM 03.93 [**Error! Reference source not found.**].

Sheet 5: the procedures CAMEL_MT_GMSC_DISC1 and CAMEL_MT_GMSC_DISC2 are specific to CAMEL; they are specified in GSM 03.78 [**Error! Reference source not found.**]. If the GMSC does not support CAMEL, processing continues from the "No" exit of the test "Result=CAMEL handling?".

Sheet 6: the processing in the branch beginning with the Int_Release_Call input will occur only if the MSC supports CAMEL.

Sheet 7: the procedure CAMEL_MT_GMSC_DISC1 is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the GMSC does not support CAMEL, processing continues from the "No" exit of the test "Result=CAMEL handling?".

Sheet 7: the procedure CAMEL_MT_GMSC_DISC2 is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [**Error! Reference source not found.**] and GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the GMSC does not support CAMEL, processing continues from the "Normal handling" exit of the test "Result?".

Sheet 7: in the upper subtree, the processing in the branch beginning with the Int_Release_Call input will occur only if the GMSC supports CAMEL.

Sheet 7: after the GMSC has sent an IAM to the destination VMSC or the forwarded-to exchange (via the process MT_CF_MSC), it acts as a relay for messages received from the originating exchange and the destination VMSC or the process MT_CF_MSC. Any message other than Address Complete, Connect, Answer or Release causes no change of state in the process MT_GMSC.

Sheet 8: When the GMSC is in state 'Wait_for_Clear', it may receive signals 'Int_Connect_To_Resource' and 'Int_Establish_Temporary_Connection' from process gsmSSF (defined in 3G TS 23.078 [28]).
The procedures CAMEL_CF_CTR and CAMEL_CF_ETC are defined in 3G TS 23.078 [28].

When these procedures are called in gsmSSF Monitoring state, the gsmSCF is only allowed to send operation PlayAnnouncement to the gsmSRF. The gsmSCF is not allowed to send operation Prompt&Collect.

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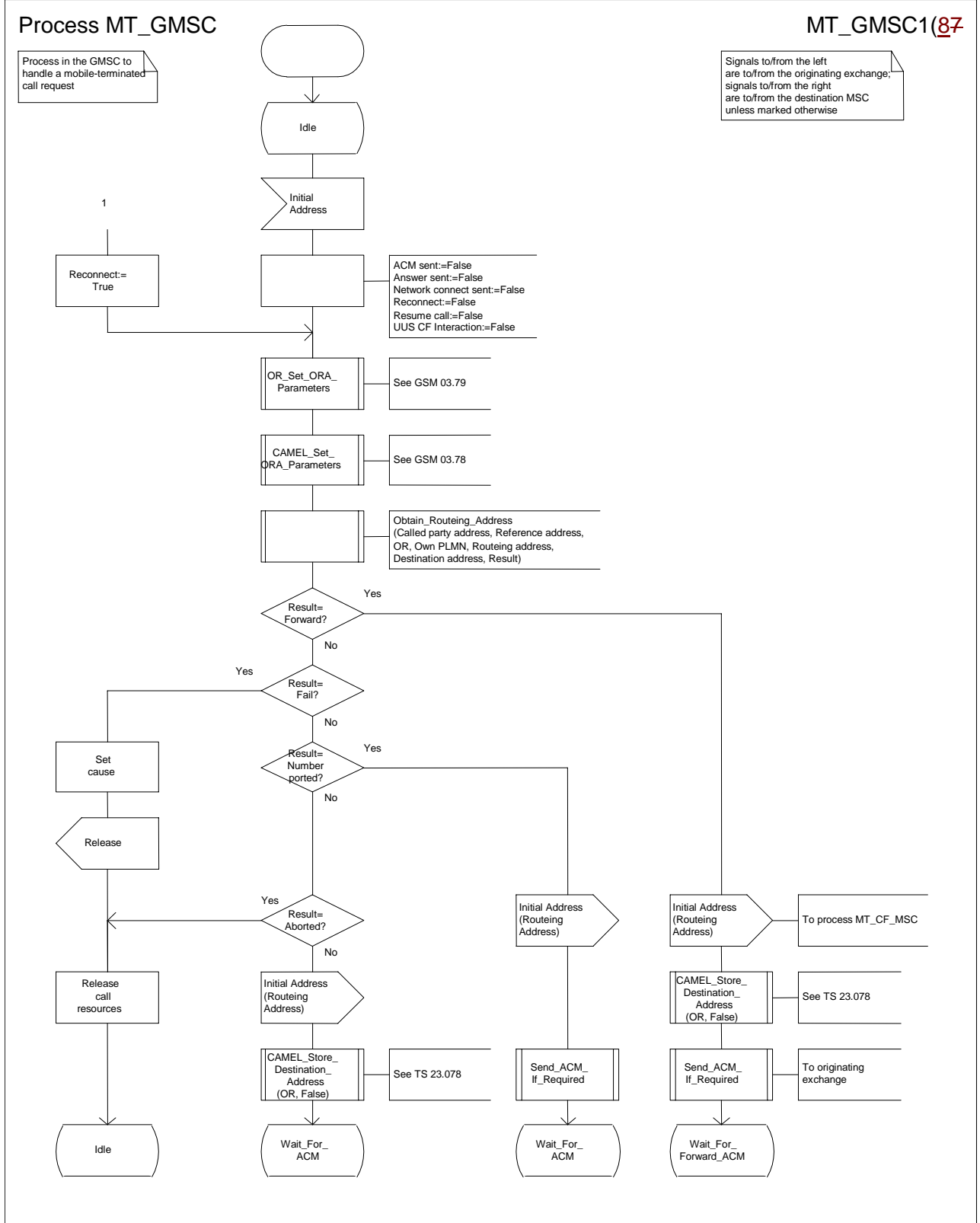


Figure 35a: Process MT_GMSC (sheet 1)

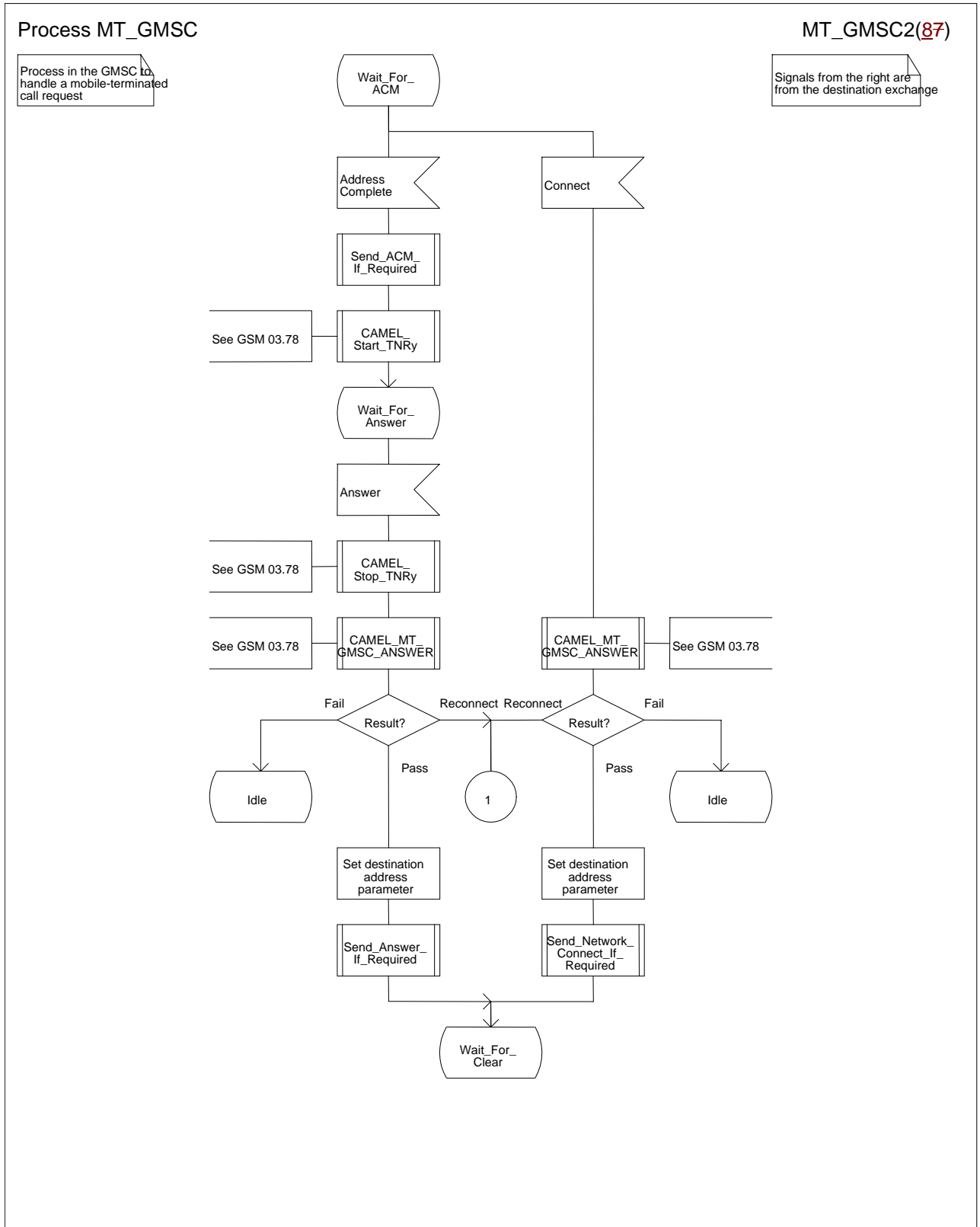


Figure 35b: Process MT_GMSC (sheet 2)

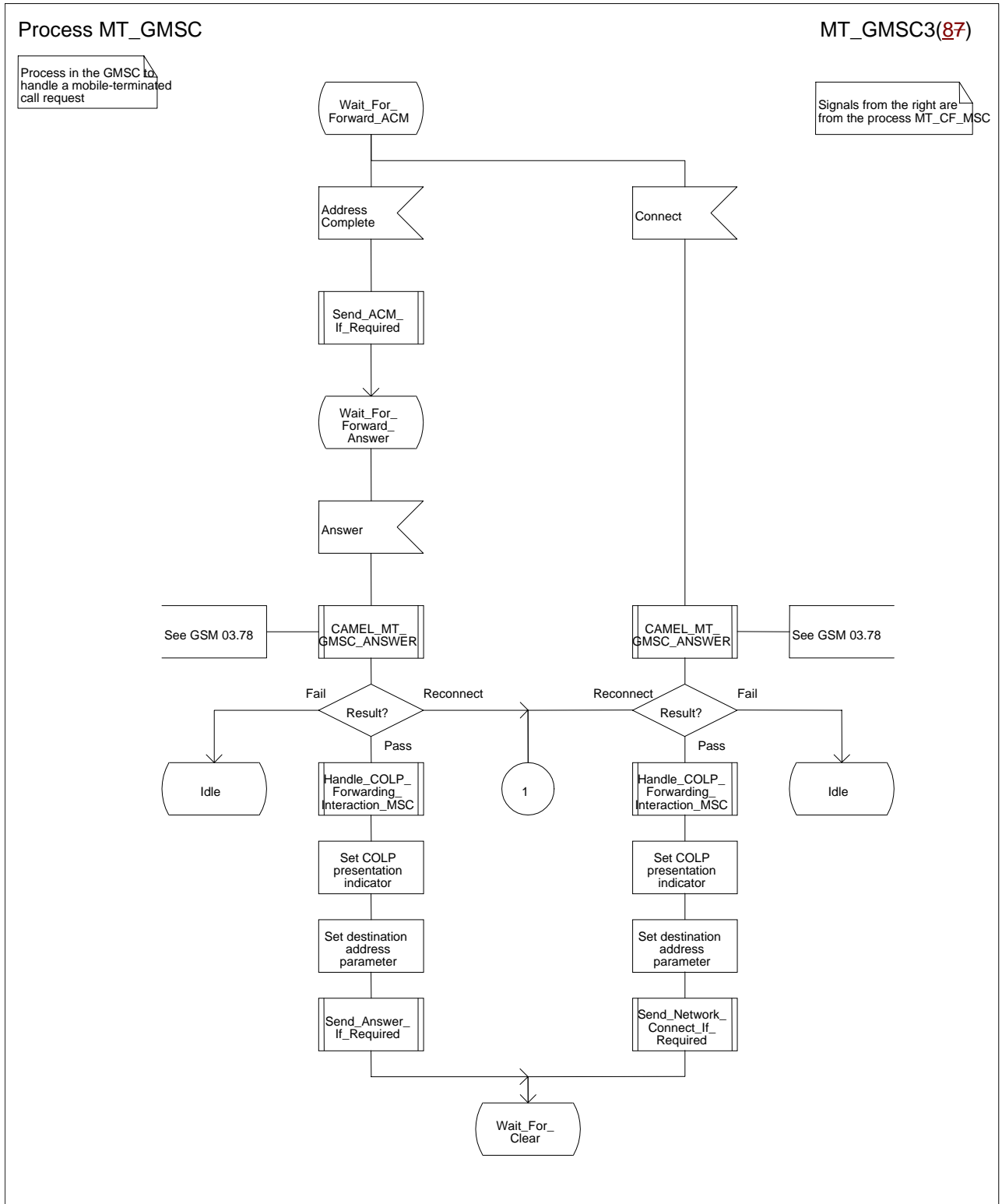


Figure 35c: Process MT_GMSC (sheet 3)

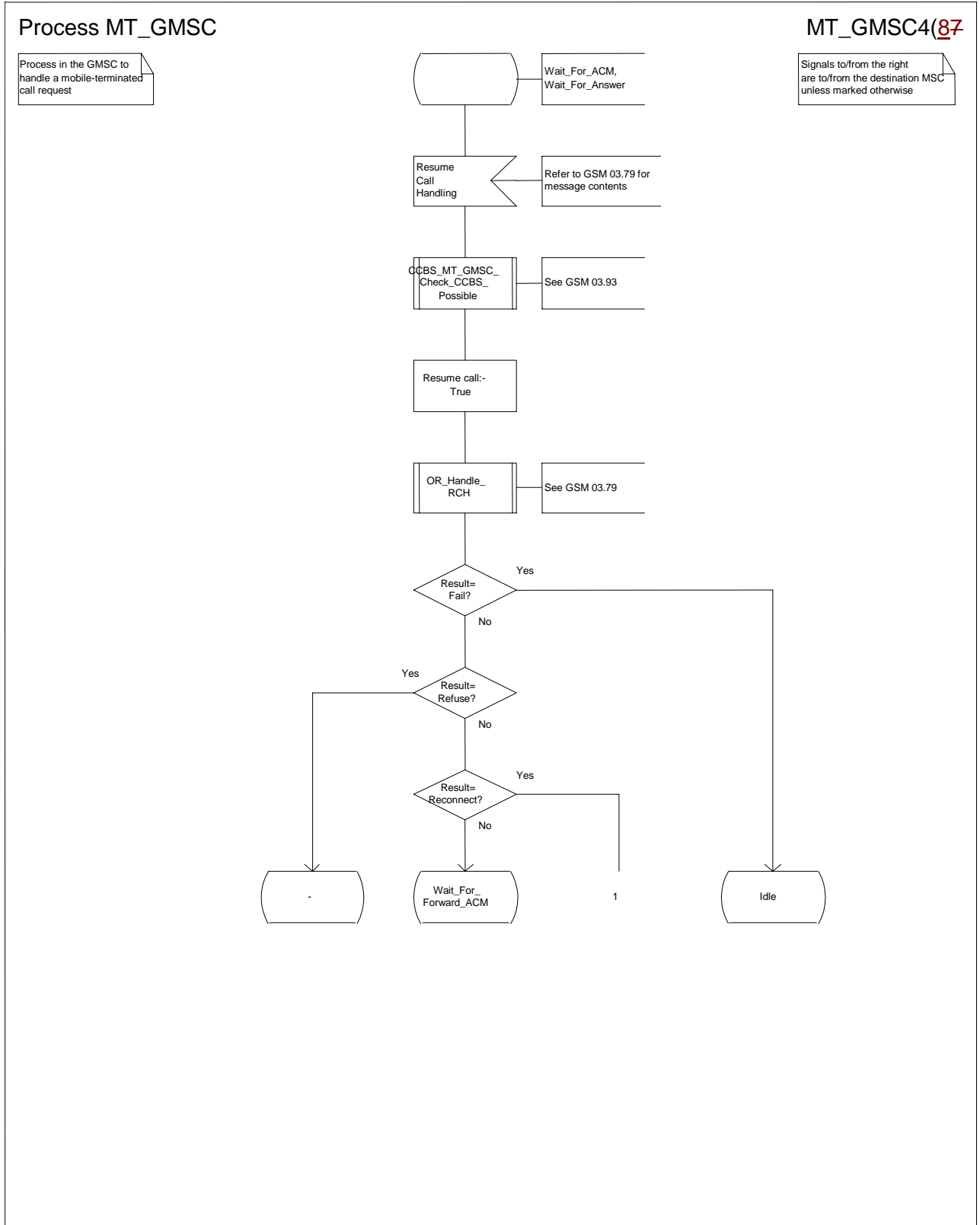


Figure 35d: Process MT_GMSC (sheet 4)

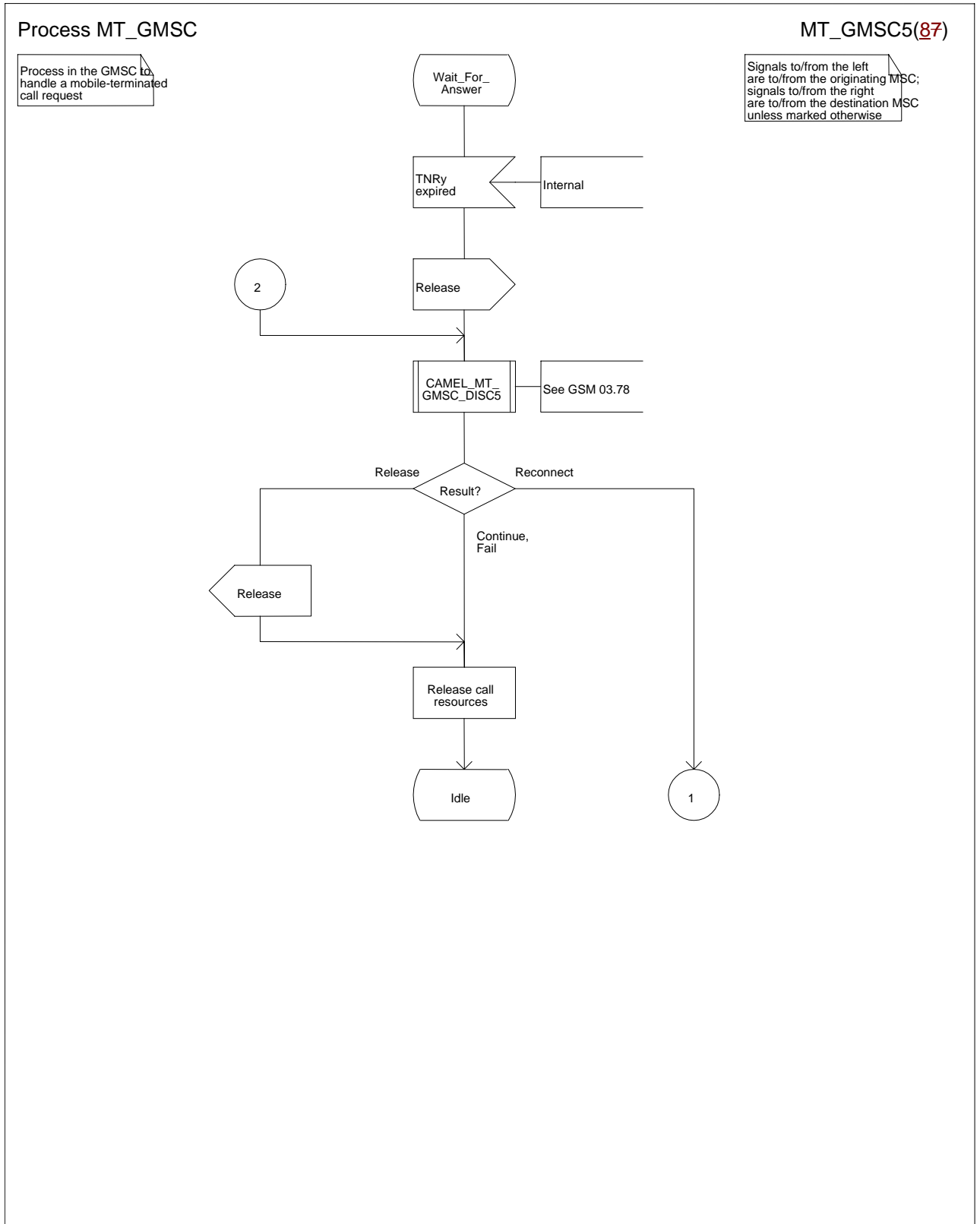


Figure 35e: Process MT_GMSC (sheet 5)

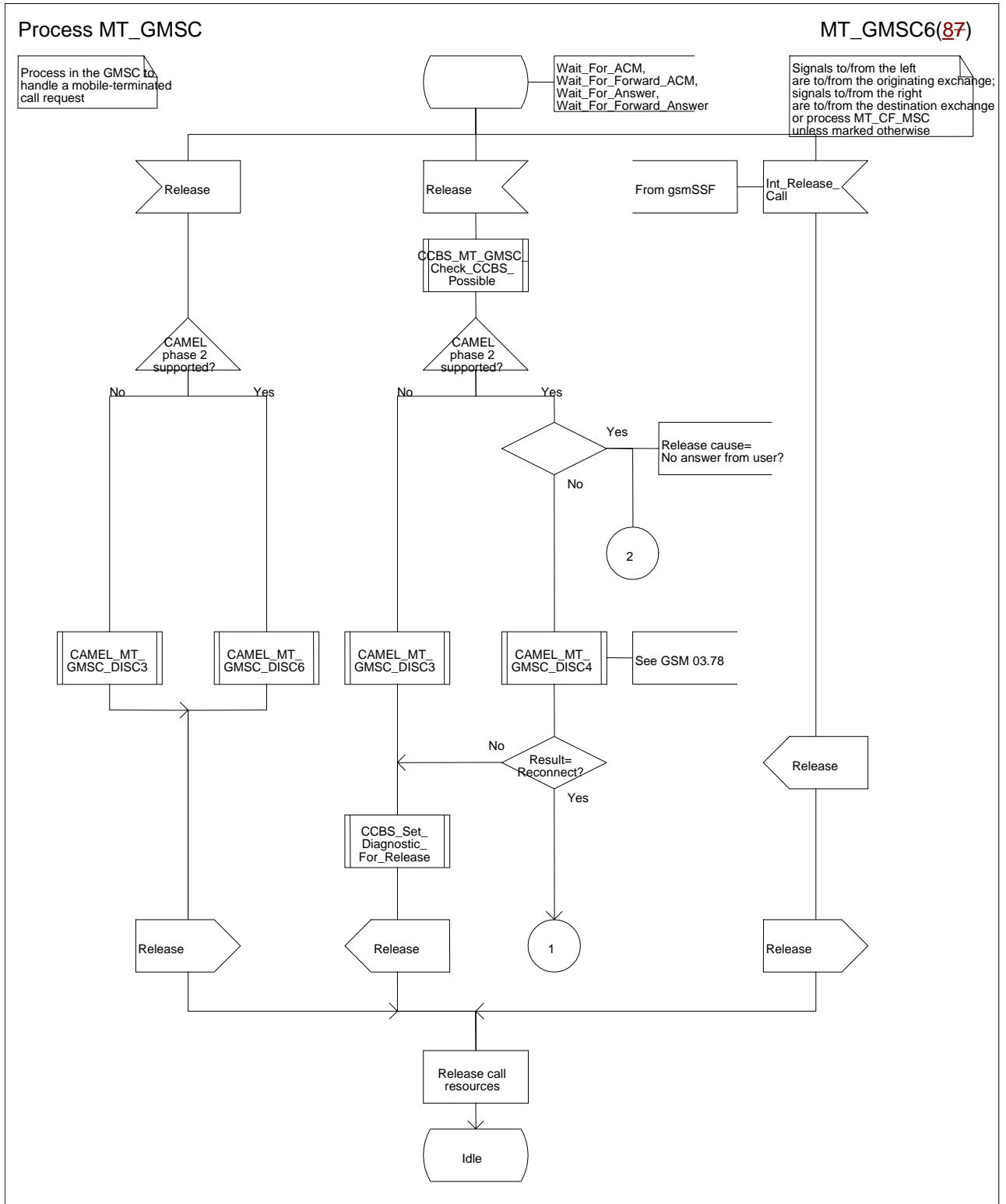


Figure 35f: Process MT_GMSC (sheet 6)

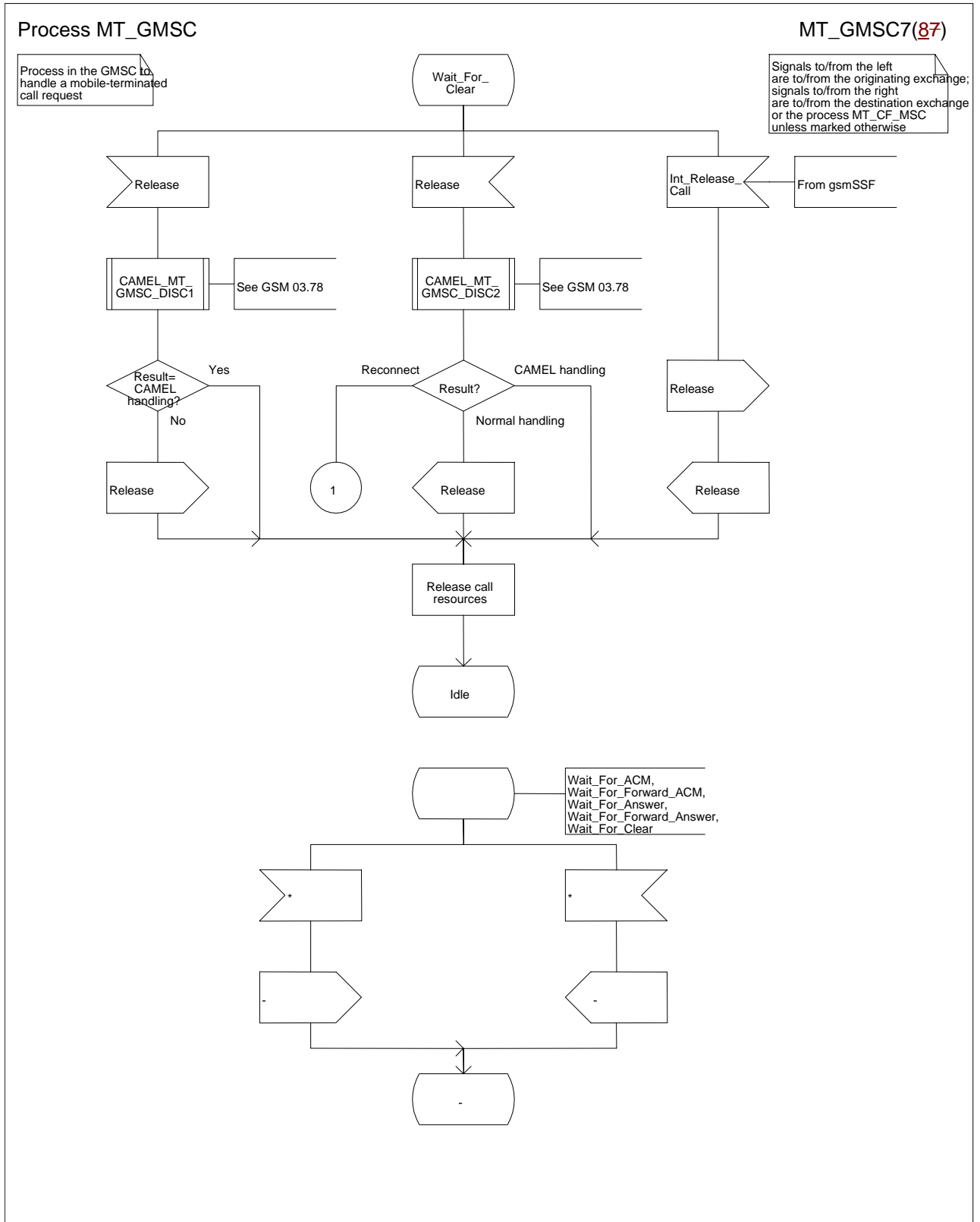


Figure 35g: Process MT_GMSC (sheet 7)

Procedure MT_GMSC

MT_GMSC8(8)

Process in the GMSC to handle a mobile-terminated call request

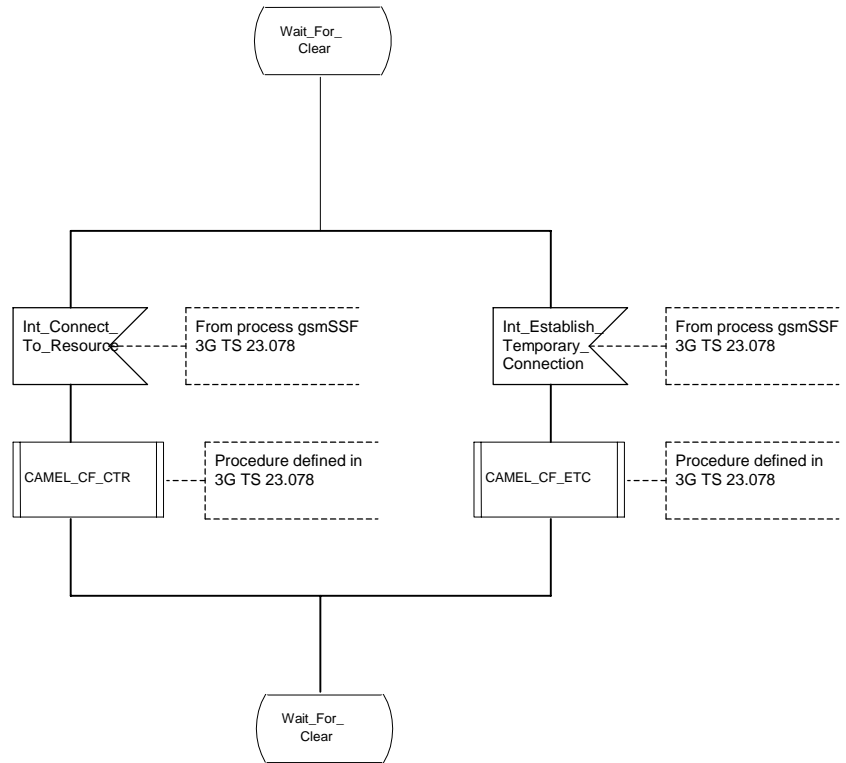


Figure 35h: Process MT_GMSC (sheet 8)

7.3 MT call

7.3.1 Functional requirements of serving MSC

7.3.1.1 Process ICH_MSC

Sheet 1: the rules for converting the ISDN BC/LLC/HLC to a GSM bearer service or teleservice are specified in GSM 09.07 [**Error! Reference source not found.**].

Sheet 1: the task "Store UUS information (if received)" is executed only if the VMSC supports UUS.

Sheet 1: the variables TCH allocated, ACM sent, Answer sent and Network connect sent are global data, accessible to the procedures Establish_Terminating_TCH_If_Required, Send_ACM_If_Required, Send_Answer_If_Required and Send_Network_Connect_If_Required.

Sheet 1: the variables UUS result sent, UUS1 implicit active, UUS1 explicit active, UUS2 active, UUS3 active and UUS CF interaction are specific to UUS. They are accessible to all UUS specific procedures.

Sheet 1: the handling starting with the input signal "Continue CAMEL handling" is specific to CAMEL phase 3. If the VMSC does not support CAMEL phase 3, this signal will not be received from the VLR.

Sheet 1: the procedure CAMEL_ICH_MSC_INIT is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**].

Sheet 2: the procedure Process_Access_Request_MSC is specified in subclause **Error! Reference source not found.**

Sheet 2: the signal input Complete Call will be received in the state Wait_For_Page_Request only if the MSC/VLR supports pre-paging.

Sheet 2, sheet 3: the suggested mapping from values of the Send Info For Incoming Call negative response information element to values of the ISUP release cause (see ITU-T Recommendation Q.850 [**Error! Reference source not found.**]) is shown in table 2. The mapping used is a matter for the network operator, depending on the telephony signalling system used.

Table 2: Suggested mapping of Send Info For Incoming Call (SIFIC) negative responses to ISUP release causes

SIFIC negative response	ISUP release cause number	ISUP release cause name
Absent subscriber	20	Subscriber absent
Busy subscriber	17	User busy
CUG reject (Called party SS interaction violation)	21	Call rejected
Forwarding violation	21	Call rejected
Impossible call completion	111	Protocol error, unspecified
No subscriber reply	19	No answer from user (user alerted)
System failure	111	Protocol error, unspecified
Unallocated roaming number	111	Protocol error, unspecified

Sheet 2, sheet 3, sheet 5, sheet 7, sheet 8, sheet 10: the procedure CAMEL_MT_GMSC_DISC4 is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL phase 3, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 2, sheet 4, sheet 7, sheet 8, sheet 10: the procedure CAMEL_MT_GMSC_DISC6 is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**].

Sheet 3: the procedure CAMEL_MT_GMSC_DISC5 is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL phase 3, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 3: the task "Store CW treatment indicator for this call if received in SII2" is executed only if the VMSC supports CAMEL phase 3.

Sheet 3: If the VMSC does not support CAMEL phase 3, the procedure Complete_Call_In_MSC and the procedure Process_Call_Waiting_MSC will not return a "Reconnect" result.

Sheet 3: the processing in the branch starting with the input signal "Process Call Waiting" is specific to Call Wait. If the VMSC does not support CW this signal will not be received from the VLR.

Sheet 3, sheet 8, the procedure CD_Reject is specific to Call Deflection; it is specified in GSM 03.72 [**Error! Reference source not found.**].

Sheet 3, sheet 8: the procedure CCBS_Set_Diagnostic_For_Release is specific to CCBS; it is specified in GSM 03.93 [**Error! Reference source not found.**].

Sheet 3, sheet 4, sheet 10, sheet 11: the procedure CCBS_Check_Last_Call is specific to CCBS; it is specified in GSM 03.93 [**Error! Reference source not found.**].

Sheet 4: the procedure UUS_ICH_Check_Support is specific to UUS; it is specified in GSM 03.87 [**Error! Reference source not found.**].

Sheet 4: the procedure CAMEL_Check_ORLCF_VMSC is specific to CAMEL phase 2; it is specified in GSM 03.78 for CAMEL Phase 2 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL, processing continues from the "ORLCF" exit of the test "Result?"

Sheet 4: the procedure Handle_ORLCF_VMSC is specific to Support of Optimal Routeing. It is specified in TS 100 045 [**Error! Reference source not found.**]. If the VMSC does not support Optimal Routeing, processing continues from the "Continue" exit of the test "ResultForwarding Failed?".

Sheet4; the procedures CD_Failure and CD_Success are specific to Call Deflection; they are specified in GSM 03.72 [**Error! Reference source not found.**].

Sheet 5: the procedure CAMEL_MT_VMSC_Notify_CF is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**].

Sheet 5: If the VMSC does not support CAMEL phase 3, processing starts with the possible call of the procedure CCBS_Check_Last_Call.

Sheet 5: The task "set redirection information" includes the the mapping of the MSISDN parameter received in the Send Info For Incoming Call ack message to the redirecting number of the IAM message and the setting of the presentation indicator of the redirecting number of the IAM message according to the value of the Redirecting presentation parameter received in the Send Info For Incoming Call ack message.

Sheet 5: it is an operator option whether to send an Address Complete message if the VLR returns forwarding information. If the VMSC sends an Address Complete message, it shall include the called party's status field of the Backward call indicator set to "no indication".

Sheet 5, sheet 7: the procedure Send_ACM_If_Required is specified in subclause **Error! Reference source not found.**

Sheet 5: the procedure Activate_CF_Process is specified in subclause **Error! Reference source not found.**

Sheet 5: the procedure UUS_ICH_Set_Info_In_IAM is specific to UUS, it is specified in GSM 03.87 [**Error! Reference source not found.**].

Sheet 5: the called party address sent in the IAM to the process MT_CF_MSC is the Forwarded-to number received in the Perform Call Forwarding ack.

Sheet 5: the procedure CAMEL_Store_Destination_Address is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**].

Sheet 5; the procedure CD_Success is specific to Call Deflection; it is specified in GSM 03.72 [**Error! Reference source not found.**].

Sheet 6: The processing on this sheet is specific to CAMEL phase 3. If the VMSC does not support CAMEL phase 3, the input signal Int_Release Call will not be received.

Sheet 7: the procedure CAMEL_MT_GMSC_ANSWER is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [**Error! Reference source not found.**]. If the VMSC does not support CAMEL phase 3, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 7: the procedure Handle_COLP_Forwarding_Interaction is specified in subclause **Error! Reference source not found.**

Sheet 7: the procedure Send_Answer_If_Required is specified in subclause **Error! Reference source not found.**

Sheet 7: the procedure Send_Network_Connect_If_Required is specified in subclause **Error! Reference source not found.**

Sheet 8: the procedure CCBS_MT_MSC_Check_Forwarding is specific to CCBS; it is specified in GSM 03.93 [19].

Sheet 11, sheet 12: the procedure CAMEL_MT_GMSC_DISC1 is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [28].

Sheet 11, sheet 12: the procedure CAMEL_MT_GMSC_DISC2 is specific to CAMEL phase 3; it is specified in TS 23.078 for CAMEL Phase 3 [28]. If the VMSC does not support CAMEL phase 3, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 11: the procedure UUS_MSC_Check_UUS1_UI is specific to UUS; it is specified in GSM 03.87 [**Error! Reference source not found.**].

Sheet 12: after the VMSC has sent an IAM to the process MT_CF_MSC, it acts as a transparent relay for messages received from the GMSC and the process MT_CF_MSC. Any message other than Address Complete, Connect, Answer or Release causes no change of state in the process ICH_MSC.

Sheet 13: The processing on this sheet is specific to CAMEL phase 3. If the VMSC does not support CAMEL phase 3, the input signal Int_Release Call will not be received.

Sheet 14: When the MSC is in state 'Wait for Clear', it may receive signals 'Int Connect To Resource' and 'Int Establish Temporary Connection' from process gsmSSF (defined in 3G TS 23.078 [28]).
The procedures CAMEL_CF_CTR and CAMEL_CF_ETC are defined in 3G TS 23.078 [28].
When these procedures are called in gsmSSF Monitoring state, the gsmSCF is only allowed to send operation PlayAnnouncement to the gsmSRF. The gsmSCF is not allowed to send operation Prompt&Collect.

...

...

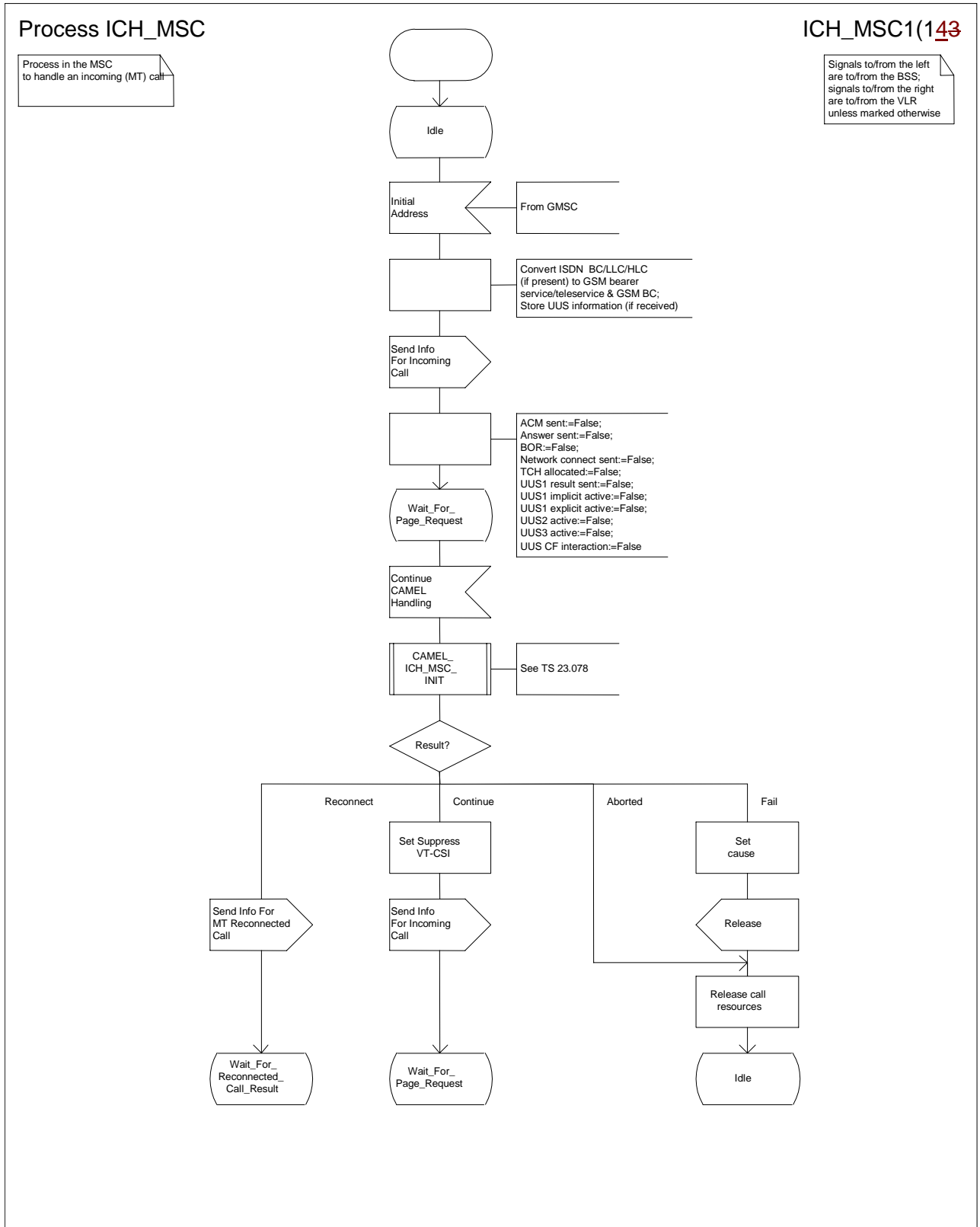


Figure 62a: Process ICH_MSC (sheet 1)

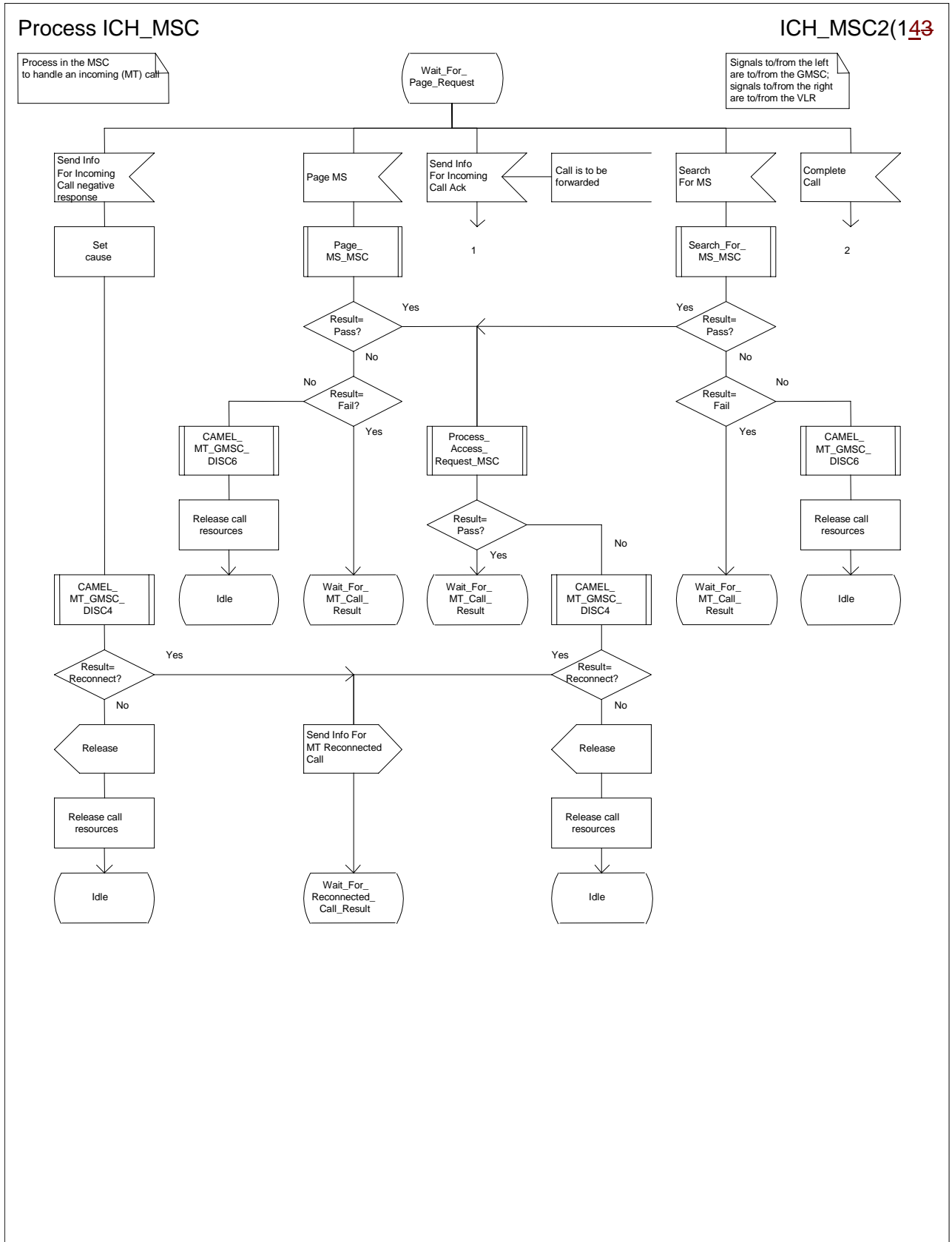


Figure 62b: Process ICH_MSC (sheet 2)

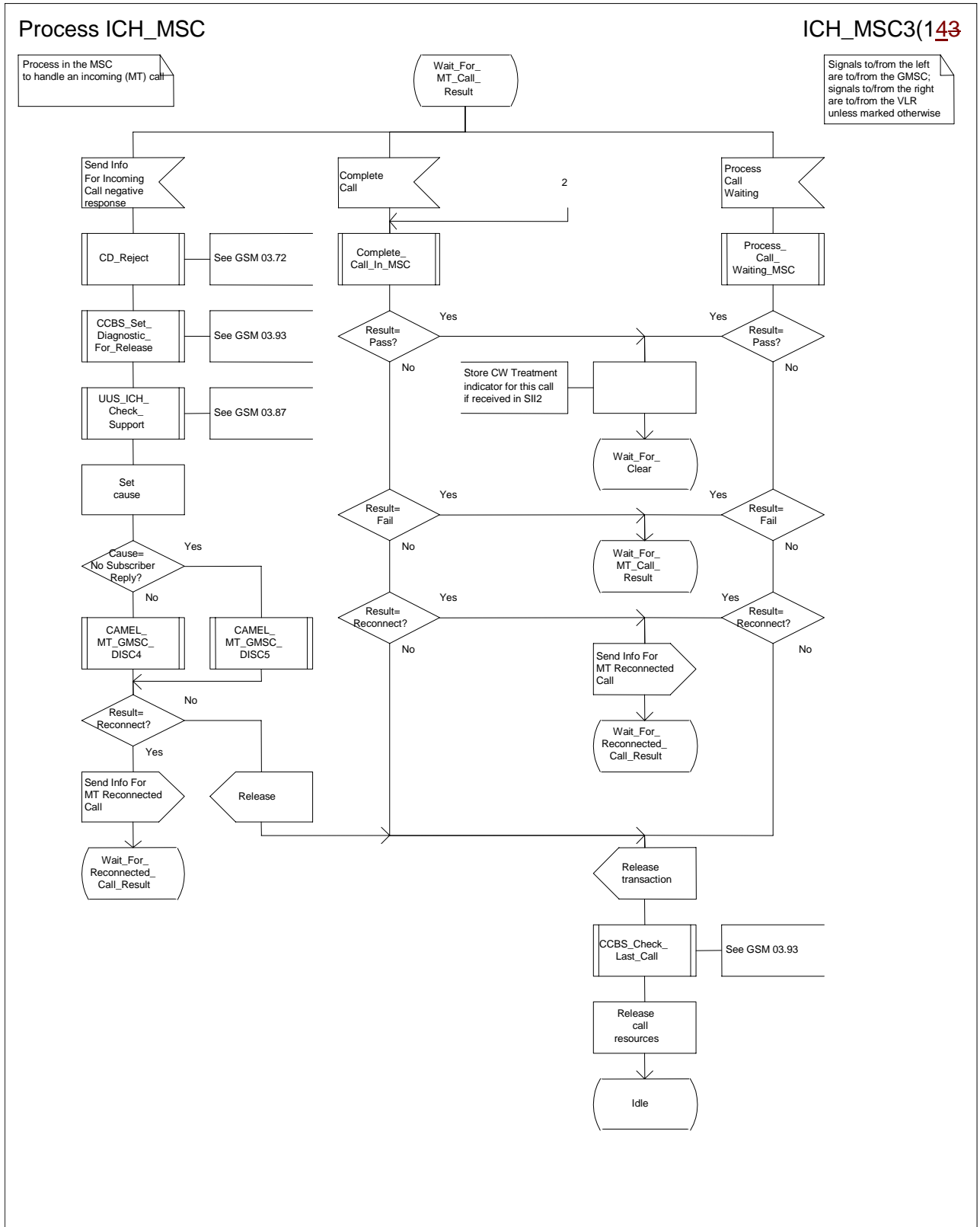


Figure 62c: Process ICH_MSC (sheet 3)

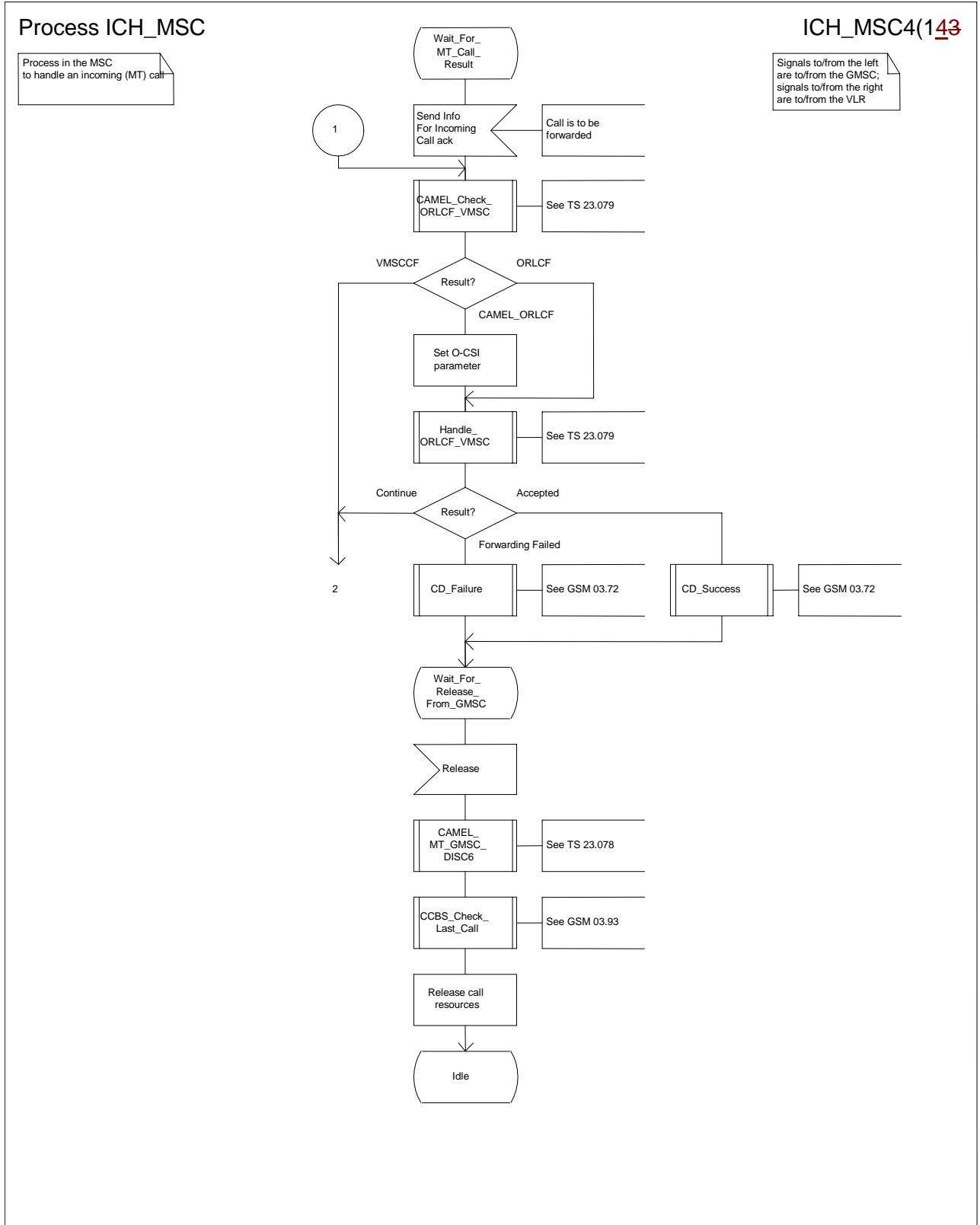


Figure 62d: Process ICH_MSC (sheet 4)

Process ICH_MSC

ICH_MSC5(143)

Process in the MSC to handle an incoming (MT) call

Signals to the right are to the VLR unless marked otherwise

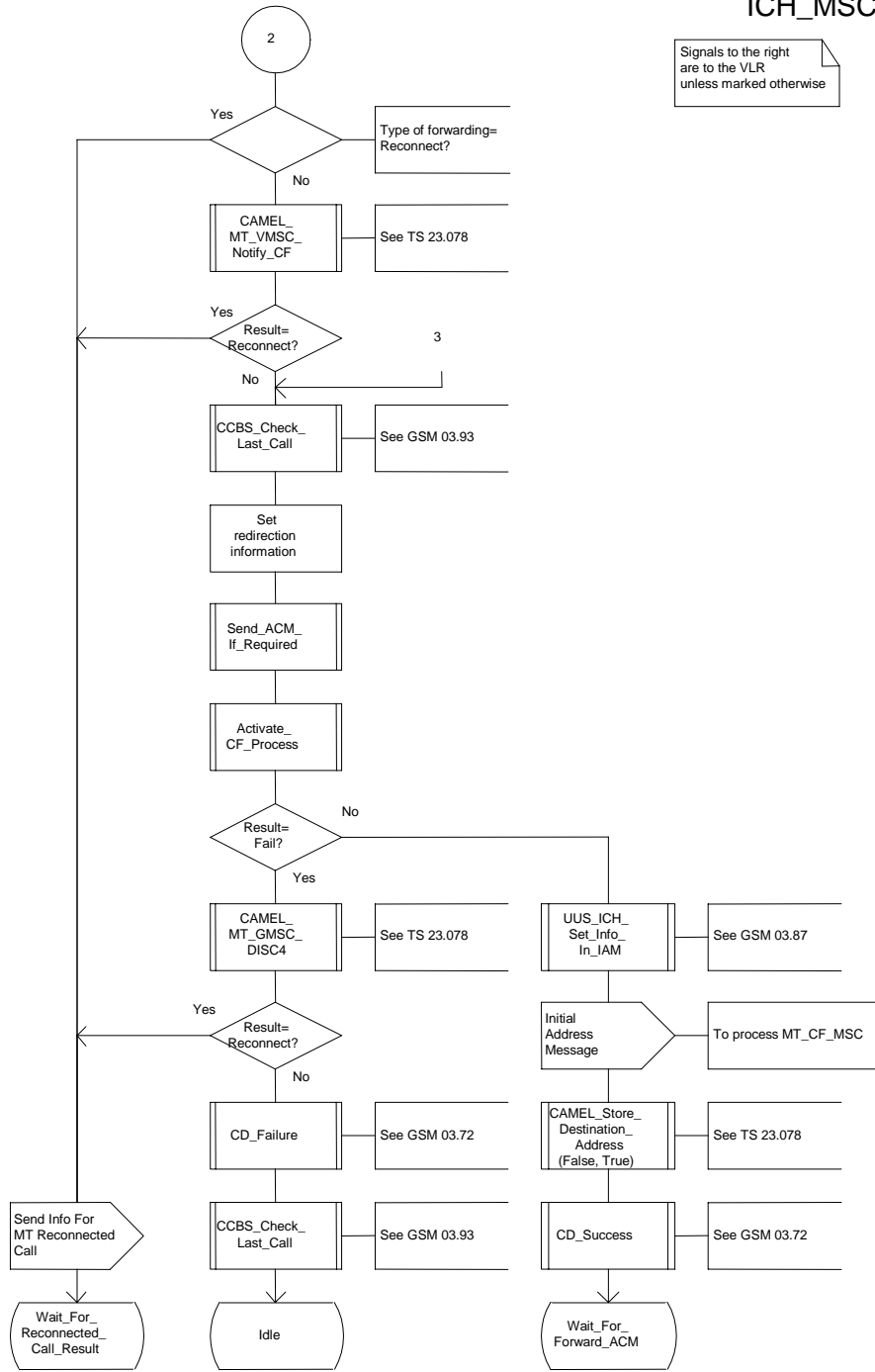


Figure 62e: Process ICH_MSC (sheet 5)

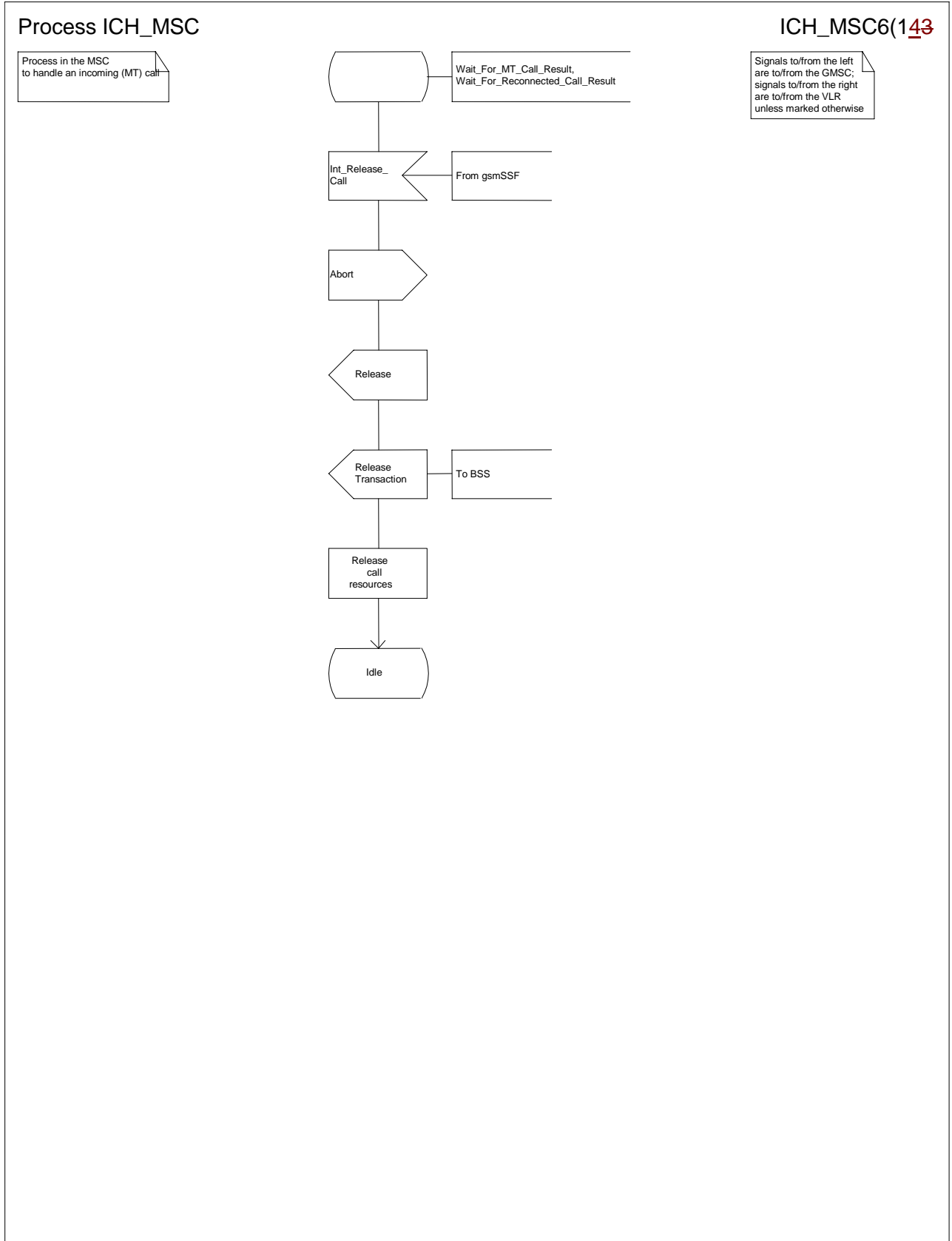


Figure 62f: Process ICH_MSC (sheet 6)

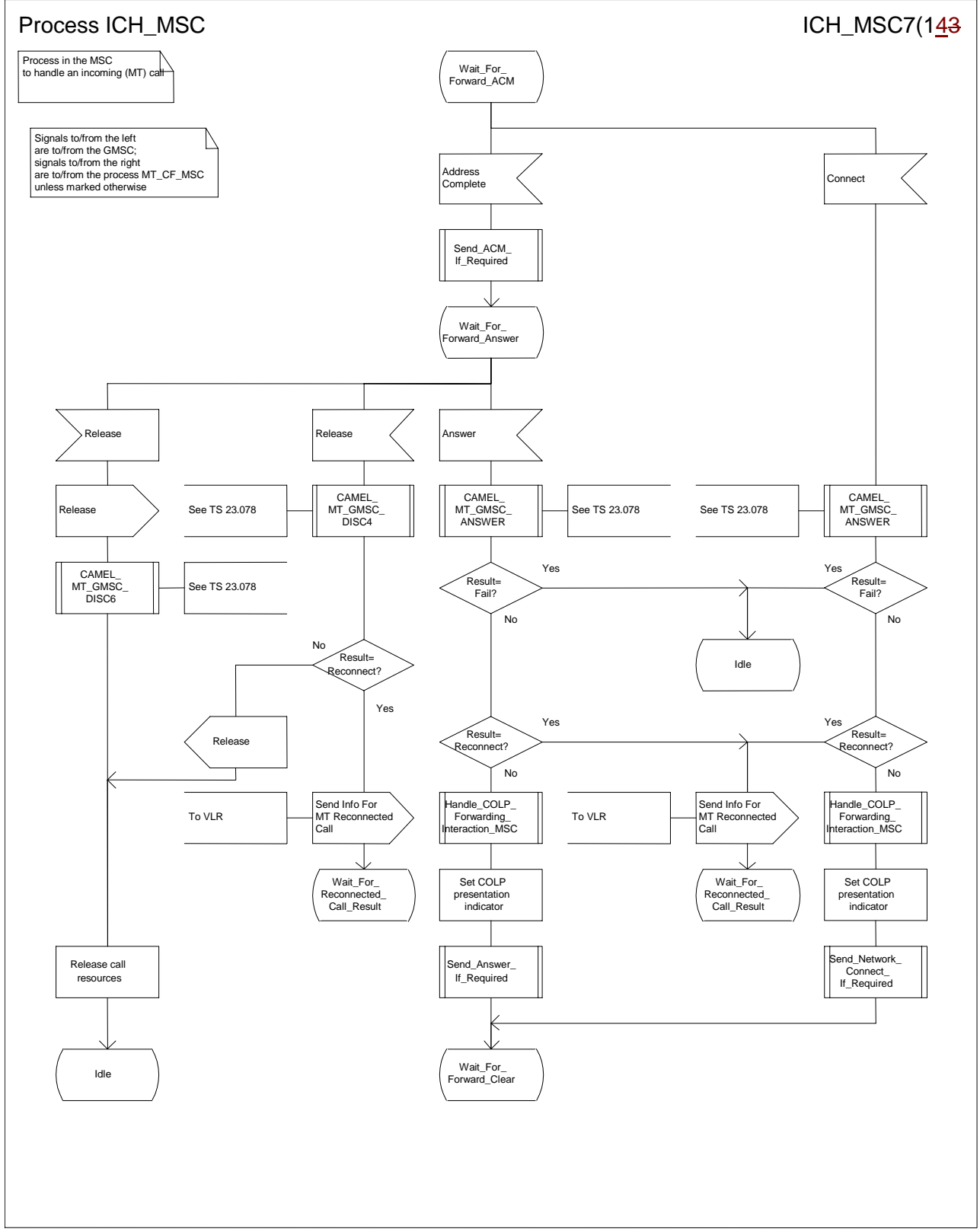


Figure 62g: Process ICH_MSC (sheet 7)

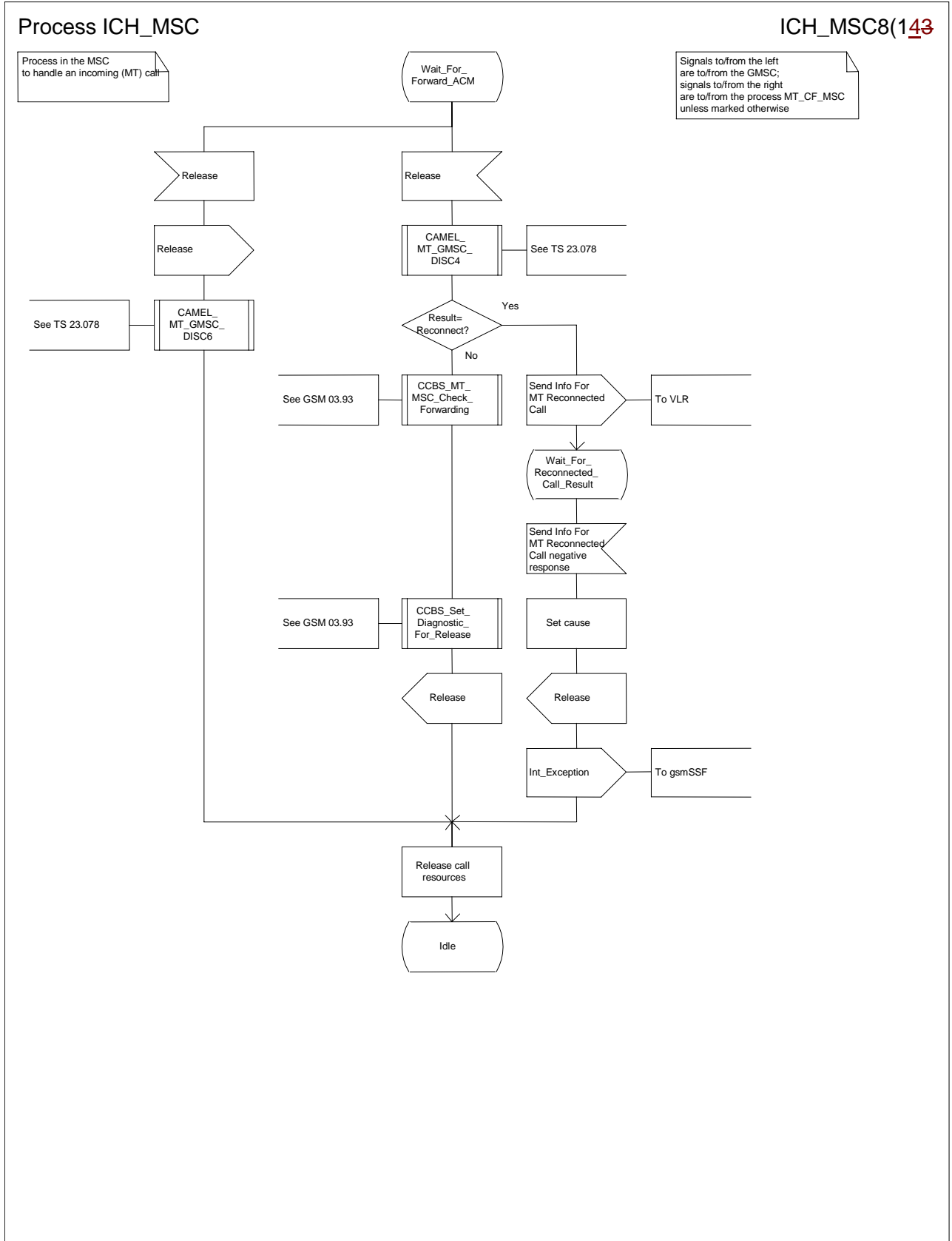


Figure 62h: Process ICH_MSC (sheet 8)

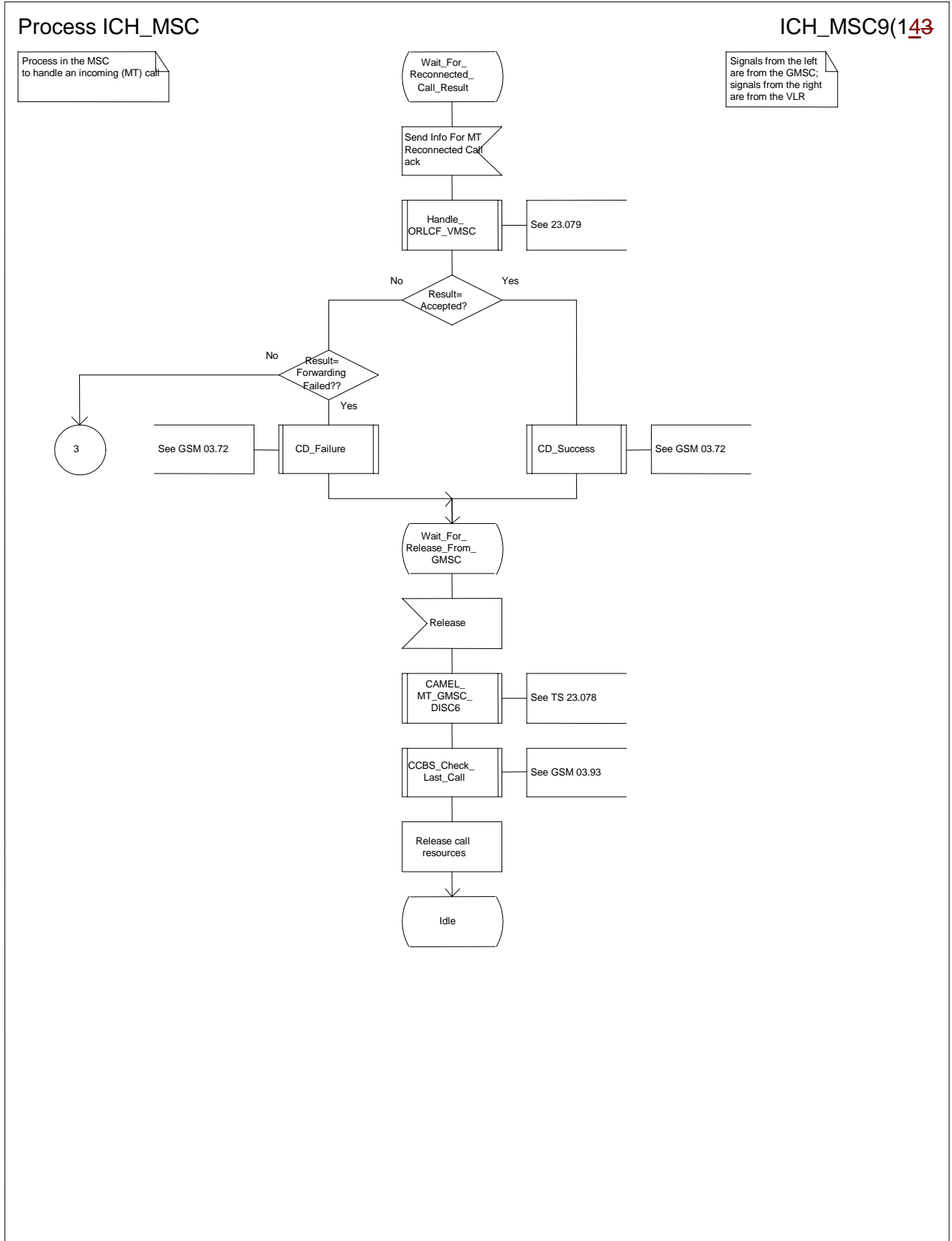


Figure 62i: Process ICH_MSC (sheet 9)

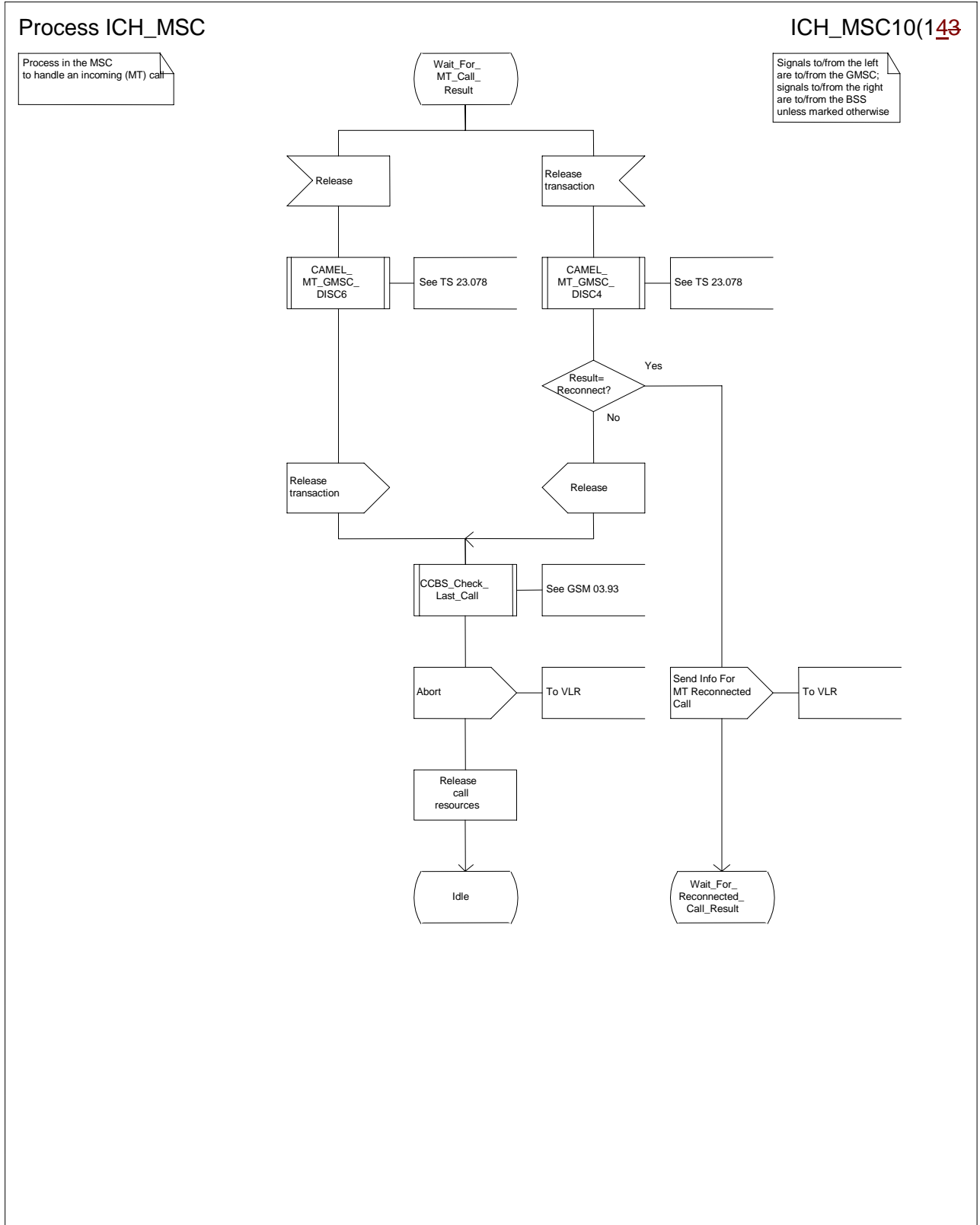


Figure 62j: Process ICH_MSC (sheet 10)

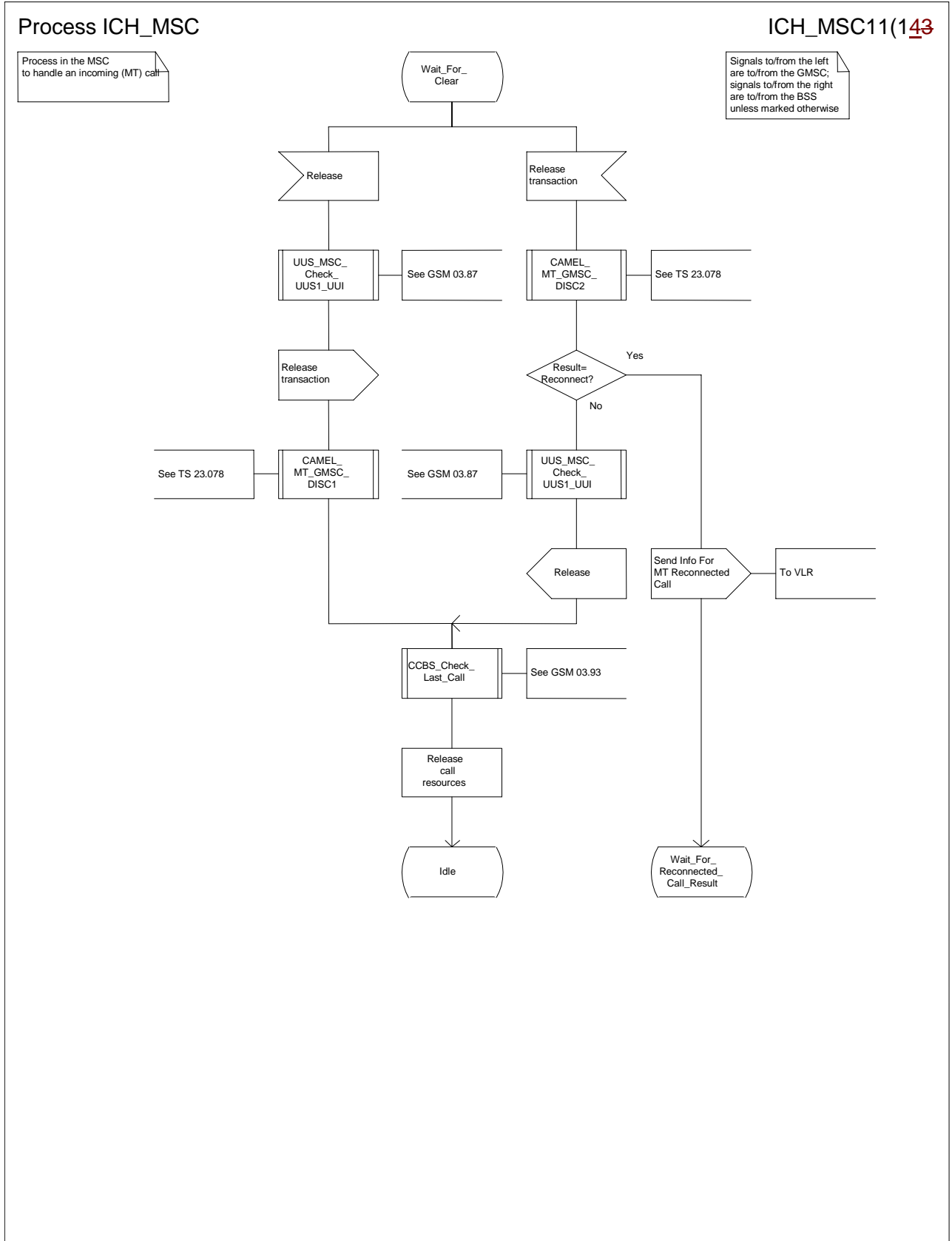


Figure 62k: Process ICH_MSC (sheet 11)

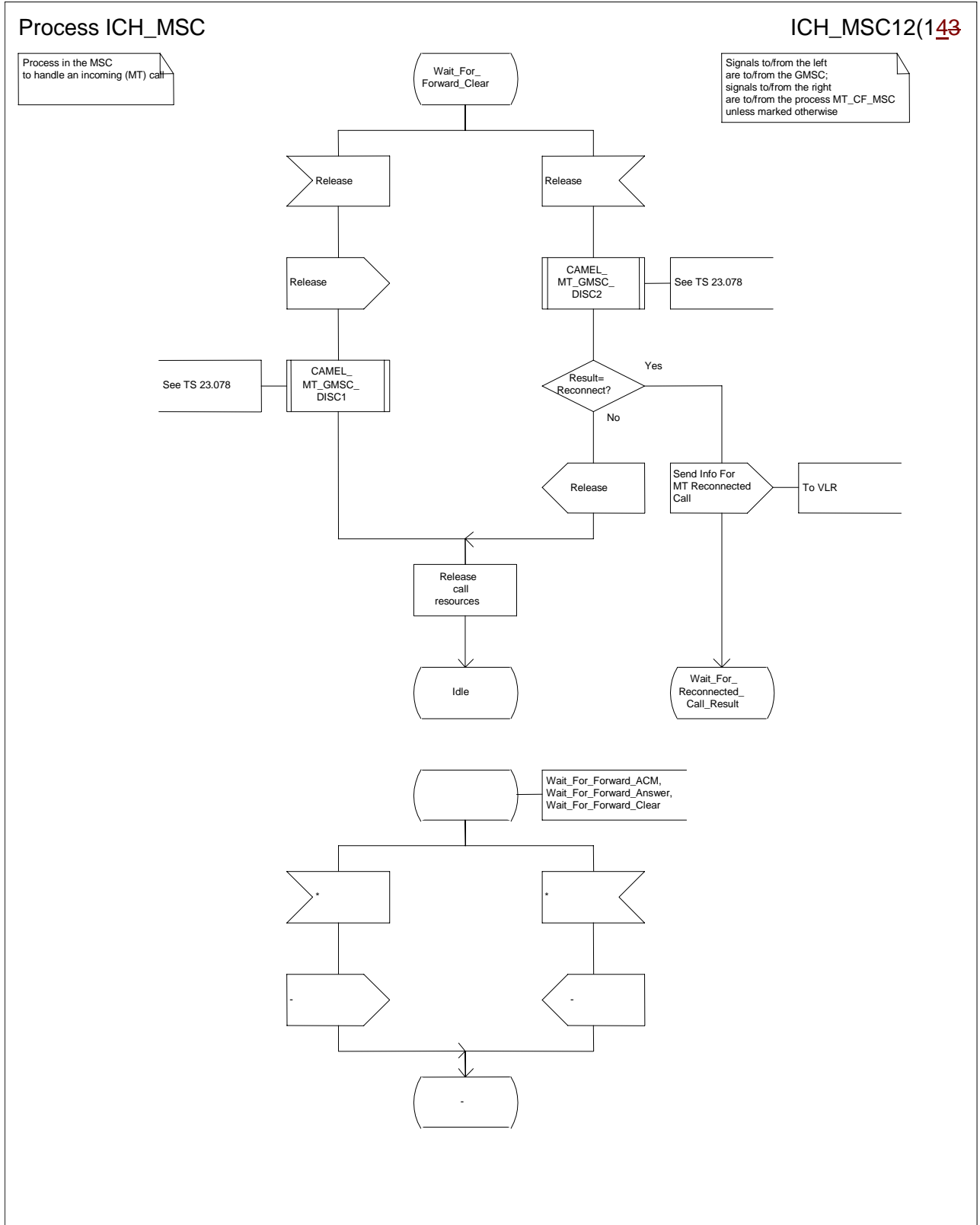


Figure 62I: Process ICH_MSC (sheet 12)

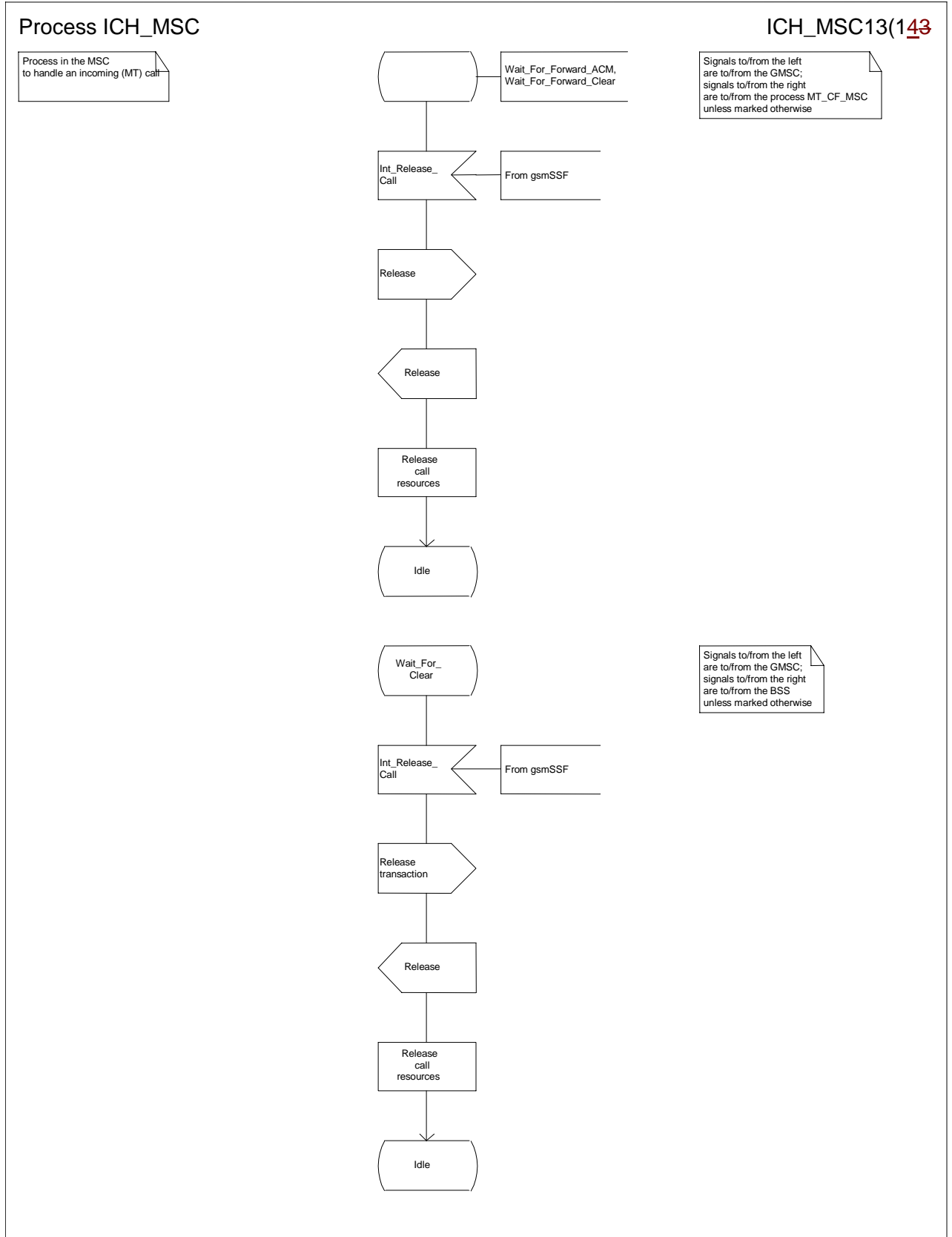


Figure 62m: Process ICH_MSC (sheet 13)

Procedure ICH_MSC

ICH_MSC14(14)

Process in the MSC to handle an incoming call

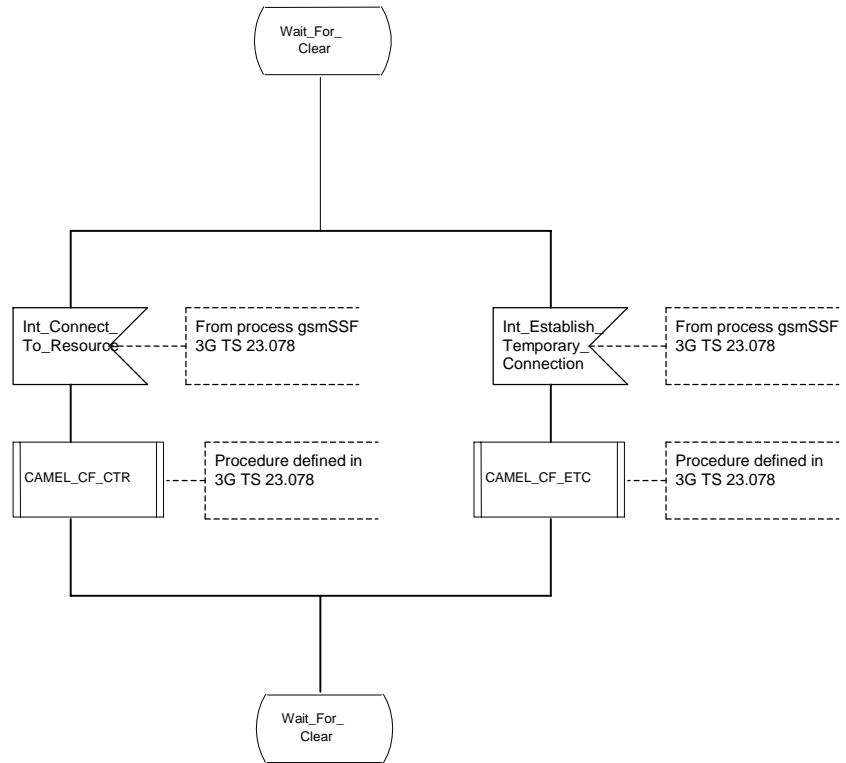


Figure 62n: Process ICH MSC (sheet 14)

3GPP-CN2 SWGA ad hoc Meeting #2
Sophia Antipolis, 21-25 February 2000

Document **N2A00-0270**

CHANGE REQUEST

23.078 CR 122r1

Current Version: 3.3.0

For submission to: CN#7

for approval
for information

strategic
non-strategic

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

Source: Ericsson

Date: 24-02-2000

Subject: User Interaction in Monitoring

Work item: CAMEL Phase 3

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

Reason for change:

Two principles for User Interaction in Monitoring are presented in this CR:

- (1) User Interaction in Monitoring shall only take place when the gsmSSF is in the Active Phase of the Call.
- (2) When User Interaction in Monitoring in monitoring state terminates, the gsmSSF shall not send an Appy Charging Report to the gsmSCF.

Clauses affected: 4.5.6.4

Other specs affected:

Other 3G core specifications	<input checked="" type="checkbox"/>	→ List of CRs:	
Other GSM core specifications	<input type="checkbox"/>	→ List of CRs:	
MS test specifications	<input type="checkbox"/>	→ List of CRs:	
BSS test specifications	<input type="checkbox"/>	→ List of CRs:	
O&M specifications	<input type="checkbox"/>	→ List of CRs:	

Other comments:

***** First Modified Section *****

4.5.6.4 Process gsmSSF and procedures

...

Process gsmSSF

8(35)

/* Invocation of gsmSSF in MO, MT, VT or CF call case. */

/* Signals to/from the left are to/from the MSC; signals to/from the right are to/from the gsmSCF. */

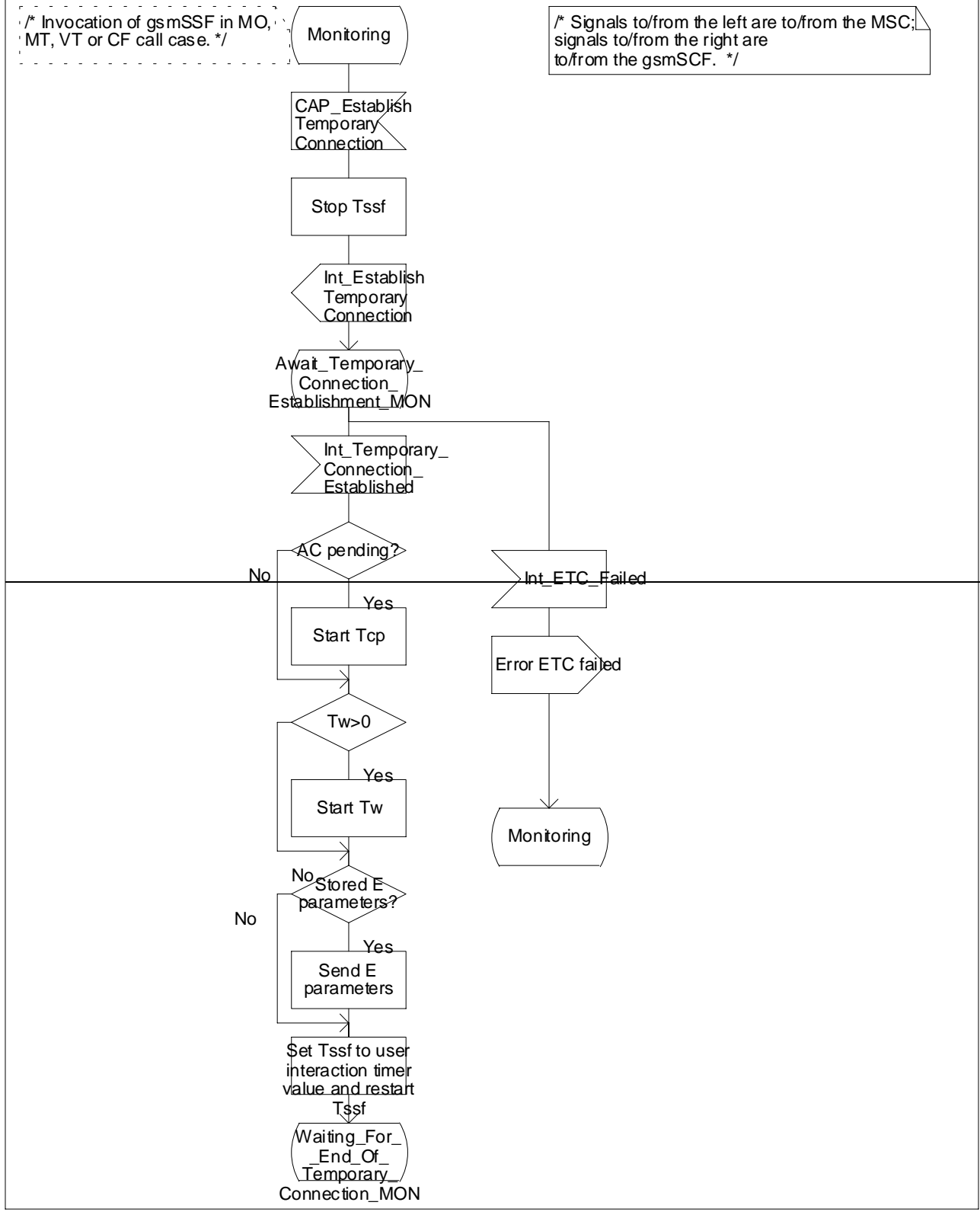


Figure 4.57h: Process gsmSSF (sheet 8)

Process gsmSSF

8(35)

/* Invocation of gsmSSF in MO, MT, VT or CF call case. */

/* Signals to/from the left are to/from the MSC, signals to/from the right are to/from the gsmSCF. */

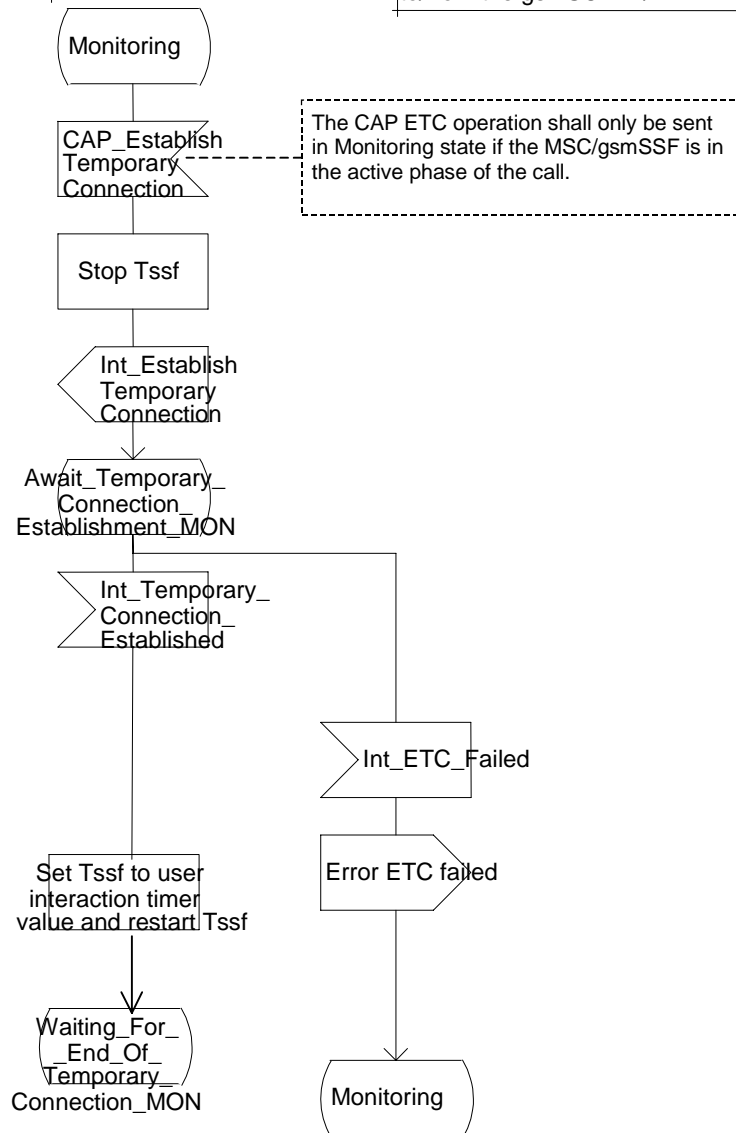


Figure 4.57h: Process gsmSSF (sheet 8)

Process gsmSSF

10(35)

/* Invocation of gsmSSF in MO, MT, VT or CF call case. */

/* Signals to/from the left are to/from the MSC; signals to/from the right are to/from the gsmSCF. */

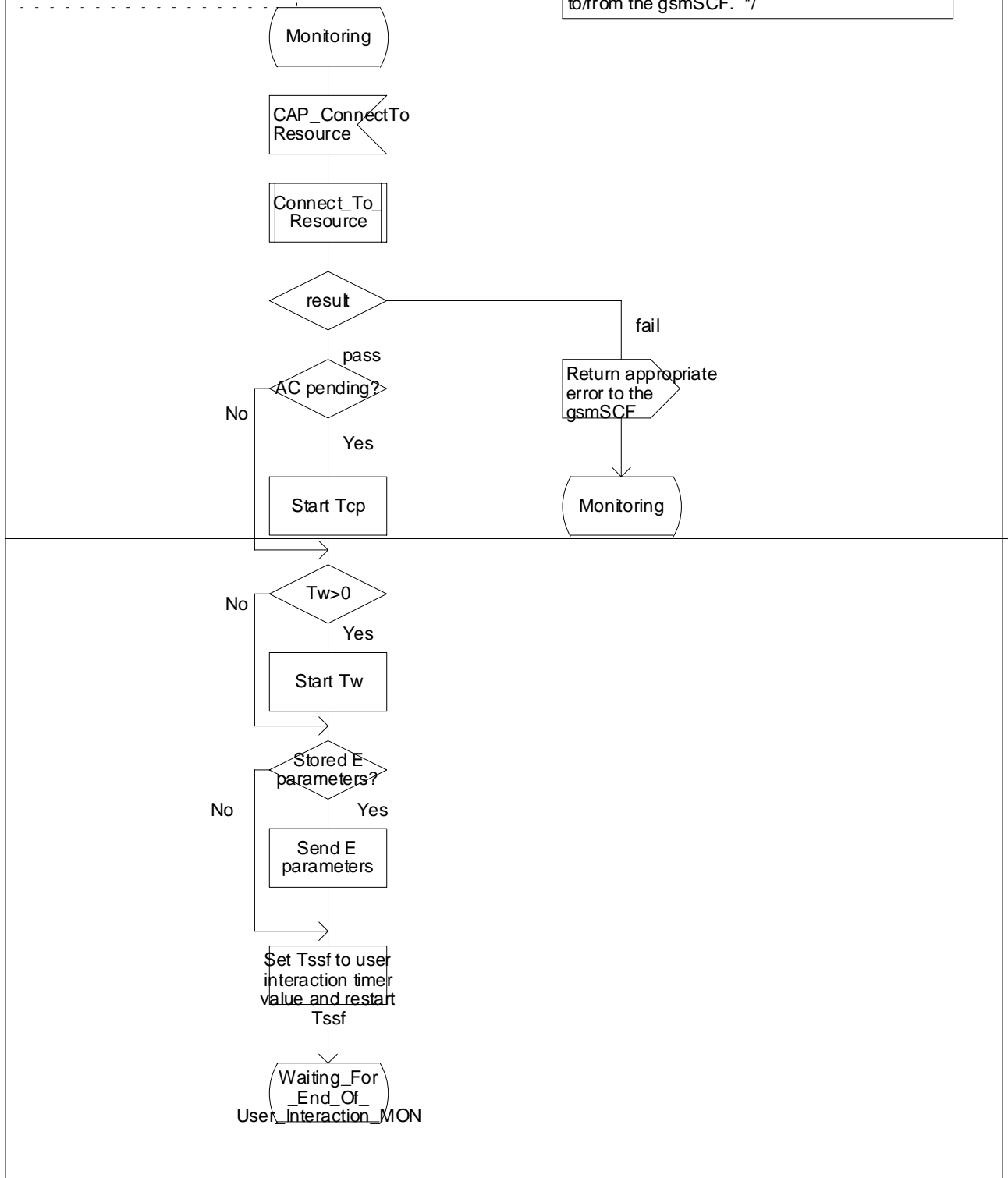


Figure 4.57j: Process gsmSSF (sheet 10)

Process gsmSSF

10(35)

/* Invocation of gsmSSF in MO, MT, VT or CF call case. */

/* Signals to/from the left are to/from the MSC; signals to/from the right are to/from the gsmSCF. */

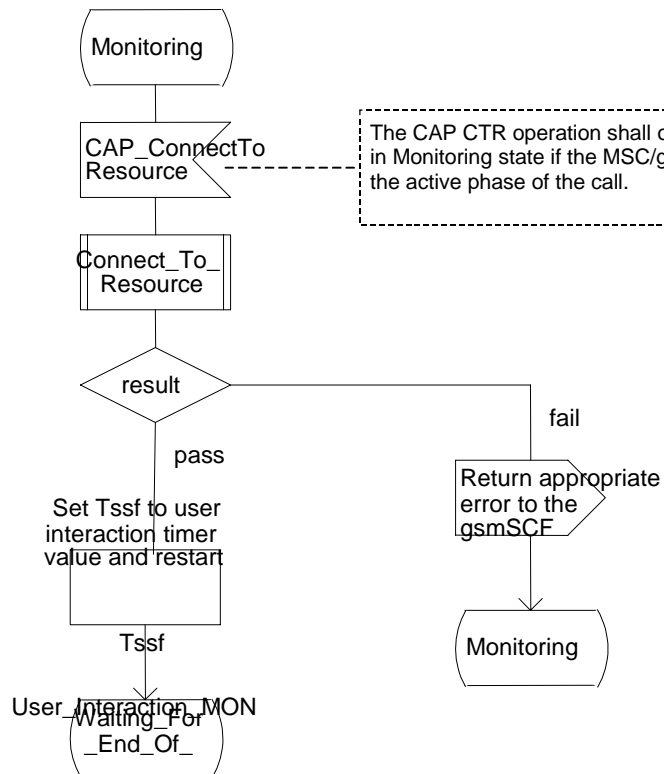


Figure 4.57j: Process gsmSSF (sheet 10)

***** Next Modified Section *****

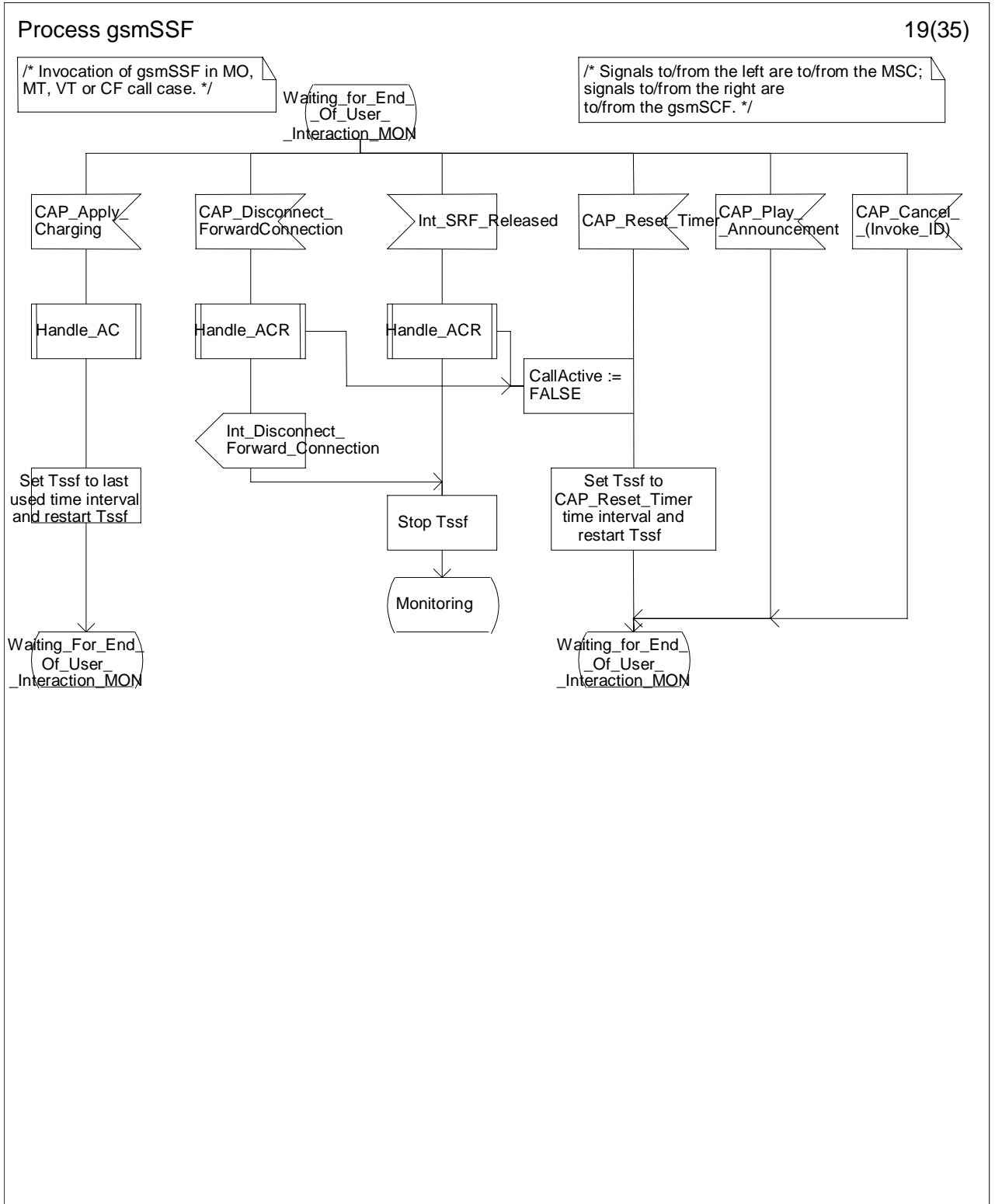


Figure 4.57s: Process gsmSSF (sheet 19)

Process gsmSSF

19(35)

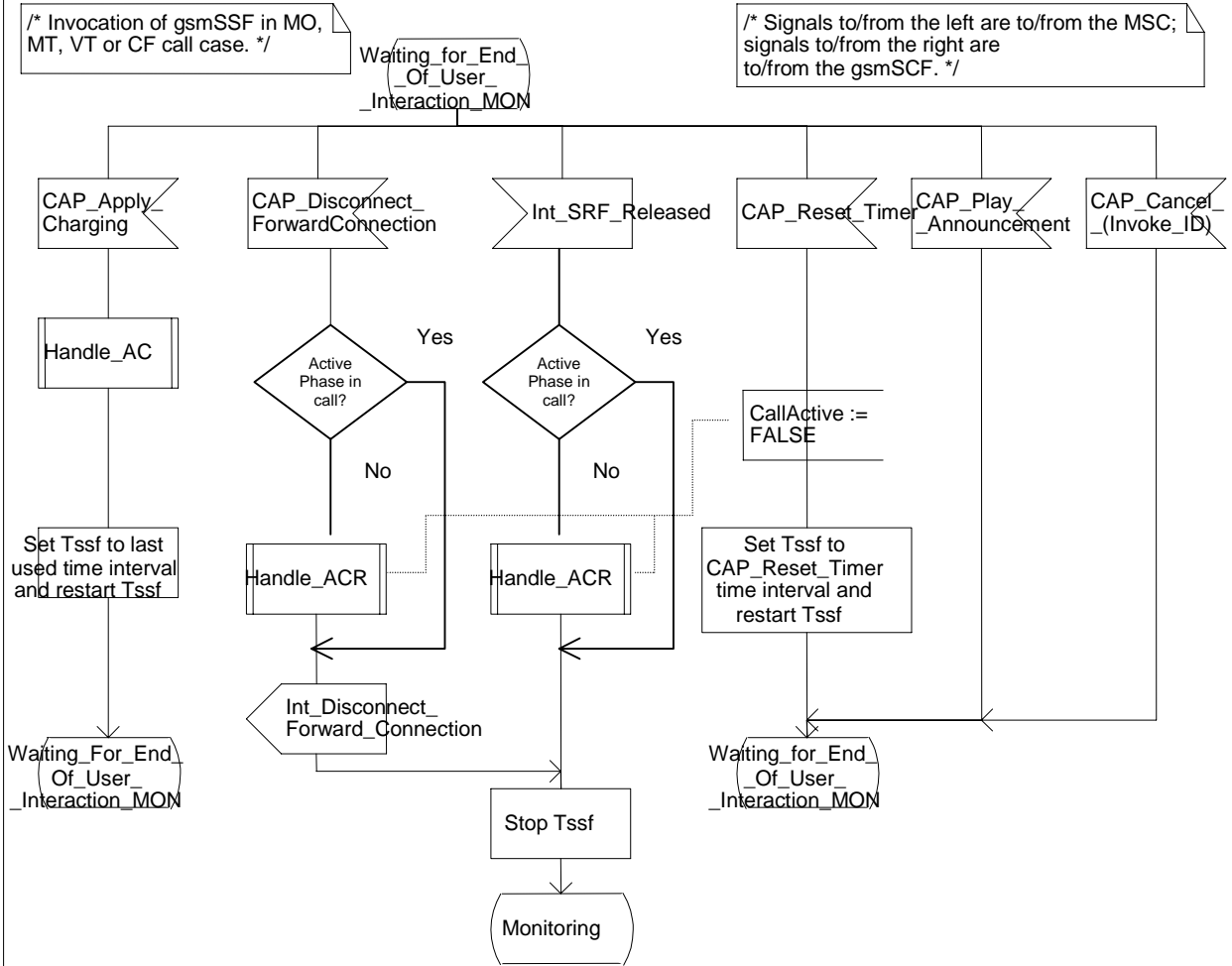


Figure 4.57s: Process gsmSSF (sheet 19)

3GPP-CN2 SWGA ad hoc Meeting #
Sophia Antipolis, 21-25 February 2000

Document **N2A000228**

CHANGE REQUEST

29.078 CR 058

Current Version: 3.2.0

For submission to: CN#7

for approval
for information

strategic
non-strategic

Proposed change affects:

(U)SIM

ME

UTRAN / Radio

Core Network

Source:

CN WG2

Date:

18-02-2000

Subject:

User Interaction in Monitoring

Work item:

CAMEL Phase 3

Category:

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

Release:

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

Reason for change:

Three principles for User Interaction in Monitoring are presented in this CR:

- (1) User Interaction in Monitoring shall only take place when the gsmSSF is in the Active Phase of the Call.
- (2) When User Interaction in Monitoring in monitoring state terminates, the gsmSSF shall not send an Appy Charging Report to the gsmSCF.
- (3) Prompt and Collect User Information shall not be used during the Active Phase of the call.

Clauses affected:

11.6, 11.16, 11.23, 11.33, 11.34

Other specs affected:

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

Other comments:

11.6 ApplyChargingReport procedure

11.6.1 General description

This operation is used by the gsmSSF to report charging related information to the gsmSCF as requested by the gsmSCF using the "ApplyCharging" operation.

During a connection configuration the "ApplyChargingReport" operation may be invoked on multiple occasions. For each call party and each connection configuration, the "ApplyChargingReport" operation may be used several times. Note that at least one "ApplyChargingReport" operation is to be sent at the end of the connection configuration charging process.

The charging scenarios supported by this operation are 4.1 and 4.2 (refer to to EN 301 140-5 , annex B).

11.6.1.1 Parameters

- CallResult:
This parameter provides the gsmSCF with the charging related information previously requested using the ApplyCharging operation. The "CallResult" is a list, and can contain the following parameters:
 - timeDurationChargingResult:
This is a list, and can contain the following parameters:
 - timeInformation
This is a choice of the following parameters:
 - timeIfNoTariffSwitch
This parameter will be present if no tariff switch has occurred since the detection of Answer for the connection to the Called Party, Temporary Connection or gsmSRF connection, otherwise it will be absent.
If present, then the elapsed time since detection of Answer is reported.
 - timeIfTariffSwitch
This parameter will be present if a tariff switch has occurred since the detection of Answer for the connection to the Called Party, Temporary Connection or gsmSRF connection, otherwise it will be absent.
If present, then the parameter may contain the following information:
 - timeSinceLastTariffSwitch
The elapsed time since detection of the last tariff switch is reported.
 - tariffSwitchInterval
This parameter is present only if a tariff switch was detected for the connection to the Called Party, the temporary connection or the gsmSRF connection in the reported call period.
If present the time interval between either the detection of the Answer event or the previous tariff switch (whichever of these events was last detected) and the last tariff switch is reported.
- partyToCharge:
The "partyToCharge" parameter as received in the related ApplyCharging operation or deduced from the default value, to correlate the result to the request.
- CallActive:
This parameter indicates whether the call is still active or has been released.

11.6.2 Invoking entity (gsmSSF)

11.6.2.1 Normal procedure

gsmSSF preconditions:

- (1) A relationship exists between the gsmSSF and the gsmSCF.
- (2) A charging event has been detected that was requested by the gsmSCF via an ApplyCharging operation or a Called Party, Temporary Connection or gsmSRF disconnection event has occurred.
No Apply Charging Report shall be sent to the gsmSCF if the Temporary Connection or gsmSRF disconnection event has occurred when the SSF-FSM was in Monitoring state and the call was in the Active phase.

gsmSSF postconditions:

- (1) If release of the call has occurred because the allowed call duration has been reached:
 - All outstanding EDPs shall be disarmed,
 - ApplyChargingReport shall be sent to gsmSCF followed by any outstanding CallInformationReports, if applicable,
 - The gsmSSF shall transit to the 'Idle' state
- (2) If release of the call has occurred but not because the allowed call duration has been reached:
 - If there are any outstanding EDPs or other reports then the gsmSSF shall remain in the same state, else
 - The gsmSSF shall transit to the 'Idle' state

This operation is invoked if a charging event has been detected that was requested by the gsmSCF.

11.6.2.2 Error handling

Generic error handling for the operation related errors are described in clause 17 and the TC services used for reporting operation errors are described in clause 19.

11.16 ConnectToResource procedure

11.16.1 General description

This operation is used to connect a call from the gsmSSF to a specialized resource. After successful connection to the gsmSRF, the interaction with the caller can take place. The gsmSSF relays all operations for the gsmSRF and all responses from the gsmSRF.

11.16.1.1 Parameters

- resourceAddress:
This parameter identifies the physical location of the gsmSRF.
- iPRoutingAddress:
This parameter indicates the routeing address to set up a connection towards the gsmSRF.
- none:
This parameter indicates that the call party is to be connected to a predefined gsmSRF in the initial CS. It is only valid when used in a single call segment CSA.
- serviceInteractionIndicatorsTwo:
This parameter contains indicators which are exchanged between SSP and SCP to resolve interactions between IN based services and network based services, respectively between different IN based services.

11.16.2 Responding entity (gsmSSF)

11.16.2.1 Normal procedure

gsmSSF precondition:

- (1) A control relationship has been established.
- (2) The SSF-FSM is in the state "Waiting for Instructions" or in the state "Monitoring".
When the SSF-FSM is in state Monitoring, then the call shall be in the Active Phase.

gsmSSF postcondition:

- (1) The call is switched to the gsmSRF.
- (2) A control relationship to the gsmSRF is established.
- (3) If in state "Waiting for Instructions" the FSM for the CS moves to the state "Waiting for End of User Interaction (WFI)". If necessary, T_{SSF} is set.
- (4) If in state "Monitoring" the FSM for the CS moves to the state "Waiting for End of User Interaction (MON)". If necessary, a guard timer T_{SSF} is set.

NOTE 1: Whether the T_{SSF} is used or not in this case is network operator dependent. But it must be synchronized with $T_{SCF-gsmSSF}$ in the SCSM.

NOTE 2: The successful connection to the gsmSRF causes a state transition in the gsmSRF FSM from "Idle" to "Connected".

11.16.2.2 Error handling

Generic error handling for the operation related errors are described in clause 17 and the TC services which are used for reporting operation errors are described in clause 19.

11.23 EstablishTemporaryConnection procedure

11.23.1 General Description

This operation is used to create a connection between an initiating gsmSSF and an assisting gsmSSF as part of a service assist procedure. It can also be used to create a connection between a gsmSSF and a gsmSRF, for the case where the gsmSRF exists in a separately addressable PE.

11.23.1.1 Parameters

- assistingSSPIPRoutingAddress:
This parameter indicates the destination address of the gsmSRF for assist procedure. The "assistingSSPIPRoutingAddress" may contain embedded within it, a "correlationID" and "scfID", but only if "correlationID" and "scfID" are not specified separately.
- correlationID:
This parameter is used by the gsmSCF to associate the "AssistRequestInstructions" from the assisting gsmSSF (or the gsmSRF) with the Request from the initiating gsmSSF. The "correlationID" is used only if the correlation id is not embedded in the "assistingSSPIPRoutingAddress". The network operators has to decide about the actual mapping of this parameter on the used signalling system.
- scfID:
See ITU-T Recommendation Q.1290 [**Error! Bookmark not defined.**]. The "scfID" is used only if the gsmSCF id is not embedded in the "assistingSSPIPRoutingAddress". The network operators has to decide about the actual mapping of this parameter on the used signalling system.
- serviceInteractionIndicatorsTwo
Indicators which are exchanged between SSP and SCP to resolve interactions between IN based services and network based services, respectively between different IN based services.

11.23.2 Responding entity (gsmSSF)

11.23.2.1 Normal procedure

gsmSSF precondition:

- (1) The SSF-FSM is in state "Waiting for Instructions" or in state "Monitoring".
When the SSF-FSM is in state Monitoring, then the call shall be in the Active Phase.
- (2) The gsmSSF is not an assisting gsmSSF.

gsmSSF postcondition:

- (1) The gsmSSF performs the call processing actions to route the call to the assisting gsmSSF or gsmSRF according to the "assistingSSPIPRoutingAddress" requested by the gsmSCF.
- (2) The CS waits for end of temporary connection.
- (3) If in state "Waiting for Instructions" the FSM for the CS moves to the state "Waiting for End of Temporary Connection (WFI)". If necessary, T_{SSF} is set.
- (4) If in state "Monitoring" the FSM for the CS moves to the state "Waiting for End of Temporary Connection (MON)". If necessary, a guard timer T_{SSF} is set.

On receipt of this operation in the SSF-FSM state "Waiting for Instructions" or "Monitoring", the SSP has to perform the following actions:

- Reset the T_{SSF} (optional)

NOTE: This "optional" means that the application timer T_{SSF} is optionally set. Whether it is used or not is network operator dependent. But it must be synchronized with $T_{SCF-gsmSSF}$ in the SCSM.

- Route the call to assisting gsmSSF or gsmSRF using "assistingSSPIPRoutingAddress".
- The gsmSSF FSM goes to state "Waiting for End of Temporary Connection (WFI)" (e7).

On receipt of this operation in the gsmSSF FSM state "Monitoring", the SSP has to perform the following actions:

- Route the call to assisting gsmSSF or gsmSRF using "assistingSSPIPRoutingAddress".

11.23.2.2 Error handling

Until the connection setup has been accepted (refer to ITU-T Recommendation Q.71 [**Error! Bookmark not defined.**]) by the assisting gsmSSF/gsmSRF, all received failure indications from the network on the ETC establishment shall be reported to the gsmSCF as ETC error ETCFailed (e.g., busy, congestion). Note that the operation timer for ETC shall be longer than the maximum allowed time for the signalling procedures to accept the connection.

Generic error handling for the operation related errors are described in clause 17 and the TC services which are used for reporting operation errors are described in clause 19.

11.33 PlayAnnouncement procedure

11.33.1 General description

This operation is used for inband interaction with a GSMuser. When used to apply user treatment to the indicated leg, the user treatment can be audible (e.g. inband tone) or visual (e.g. text displayed).

11.33.1.1 Parameters

- informationToSend:
This parameter indicates an announcement, a tone or display information to be sent to the end user by the gsmSRF.
- inbandInfo:
This parameter specifies the inband information to be sent.
 - messageID:
This parameter indicates the message(s) to be sent, this can be one of the following:
 - elementaryMessageID:
This parameter indicates a single announcement.
 - text:
This parameter indicates a text to be sent. The text shall be transformed to inband information (speech) by the gsmSRF. This parameter consist of two subparameters, messageContent and attributes. The attributes of text may consist of items such as language.
 - elementaryMessageIDs:
This parameter specifies a sequence of announcements.
 - variableMessage:
This specifies an announcement with one or more variable parts.
 - numberOfRepetitions:
This parameter indicates the maximum number of times the message shall be sent to the end-user.
 - duration:
This parameter indicates the maximum time duration in seconds that the message shall be played/repeated. ZERO indicates endless repetition.
 - interval:
This parameter indicates the time interval in seconds between repetitions, i.e. the time between the end of the announcement and the start of the next repetition. This parameter can only be used when the number of repetitions is > 1.
- tone:
This parameter specifies a tone to be sent to the end-user.
 - toneID:
This parameter indicates the tone to be sent.
 - duration:
This parameter indicates the time duration in seconds of the tone to be sent. ZERO indicates infinite duration.
- displayInformation:
This parameter indicates a text string to be sent to the end-user. This information can not be received by a PSTN end-user.

NOTE: As the current signalling systems (DSS1/ISUP) do not provide an indication whether or not information can be displayed by the user's terminal, in case of user interaction with an ISDN user two consecutive "PlayAnnouncement" operations are sent. The first contains the display information, the second contains the inband information to be sent to the user. Since the execution of the display information by the gsmSRF should take a limited amount of time, the inband information will be immediately sent by the gsmSRF to the user, in sequence with the display information.

- disconnectFromIPForbidden:
This parameter indicates whether or not the gsmSRF should be disconnected from the user when all information has been sent.
- requestAnnouncementComplete:
This parameter indicates whether or not a "SpecializedResourceReport" shall be sent to the gsmSCF when all information has been sent.

11.33.2 Responding entity (gsmSRF)

11.33.2.1 Normal procedure

gsmSRF precondition:

- (1) The SRSM-FSM is in the state "Connected", or in the state "User Interaction" if the gsmSRF received previously an operation from the gsmSCF..

gsmSRF postcondition:

- (1) The gsmSRF sends the information to the user as indicated by "informationToSend".
- (2) The SRSM-FSM moves to the state "User Interaction", or remains in the same state.
- (3) If all information has been sent and "RequestAnnouncementComplete" was set TRUE, the SRSM sends a "SpecializedResourceReport" operation to the gsmSCF.
- (4) If all information has been sent and "disconnectFromIPForbidden" was set FALSE, the SRSM disconnects the gsmSRF from the user.

The announcement sent to the end-user is ended in the following conditions:

- if neither "duration" or "numberOfRepetitions" is specified, then the network specific announcement ending conditions shall apply; or
- if "numberOfRepetitions" is specified, when all repetitions have been sent, or
- if duration is specified, when the duration has expired. The announcement is repeated until this condition is met, or
- if "duration" and "numberOfRepetitions" is specified, when one of both conditions is satisfied (whatever comes first).

The Play Announcement procedure may be used during the Active Phase of the call.

11.33.2.2 Error handling

If a Cancel operation is received before or during the processing of the operation then the operation is immediately cancelled and the error "Canceled" is reported to the invoking entity.

Generic error handling for the operation related errors are described in clause 17 and the TC services which are used for reporting operation errors are described in clause 19.

11.34 PromptAndCollectUserInformation procedure

11.34.1 General description

This operation is used to interact with a call party in order to collect information.

11.34.1.1 Parameters

- collectedInfo:

- collectedDigits:

- minimumNbOfDigits:

If this parameter is missing, the default value is defined to be 1. The "minimumNbOfDigits" specifies the minimum number of valid digits to be collected.

- maximumNbOfDigits:

This parameter shall always be present and specifies the maximum number of valid digits to be collected. The following applies:

"maximumNbOfDigits" ≥ "minimumNbOfDigits".

- endOfReplyDigit:

This parameter indicates the digit(s) used to signal the end of input, and can be one or two digits.

In case the "maximumNbOfDigits" > "minimumNbOfDigits" the following applies:

If "endOfReplyDigit" is not present, the end of input is indicated:

- when the inter-digit timer expires; or
- when the number of valid digits received equals the "maximumNbOfDigits".

If "endOfReplyDigit" is present, the end of input is indicated:

- when the inter-digit timer expires; or
- when the end of reply digit is received; or
- when the number of valid digits received equals the "maximumNbOfDigits".

When the end of input is attained, the collected digits are sent from gsmSRF to the gsmSCF. In the case the number of valid digits received is less than the "minimumNbOfDigits" when the inter-digit timer expires or when the end of reply digit is received, the input is specified as being erroneous.

- cancelDigit:

If this parameter is present, the cancel digit(s) can be entered by the user to request a possible retry. This parameter can be one or two digits. All digits already received by the gsmSRF are discarded and the same PromptAndCollectUserInformation procedure is performed again, thus e.g. the same announcement to request user information is given to the user and information is collected. If this parameter is not present, the user is not able to request a possible retry.

- startDigit:

If this parameter is present, the start digit indicates the start of the valid digits to be collected. The digits that are received by the gsmSRF before this start digit is received, are discarded and are not considered to be valid. This parameter can be one or two digits.

If this parameter is not present, all received digits are considered to be valid.

When the end of input is attained, the collected digits are sent from gsmSRF to the gsmSCF, including the 'startDigit' if received by the gsmSRF.

- firstDigitTimeOut:

If this parameter is present, the first digit should be received by the gsmSRF before the first-digit timer expiration. If the first digit is not received before first-digit timer expiration, the input is regarded to be erroneous. After receipt of the first valid or invalid input digit, the corresponding first-digit timer is stopped.

If this parameter is not present, then the gsmSRF uses a default value for the first-digit timer.

If "startDigit" is present, the first-digit timer is stopped after the start digit is received.

- interDigitTimeOut:

If this parameter is present any subsequent valid or invalid digit, should be received by the gsmSRF before the inter-digit timer expires. As a result the inter-digit timer is reset and restarted.

If a subsequent valid or invalid digit is not received before the inter-digit timer expires and the number of received valid digits is less than the "minimumNbOfDigits", the input is regarded to be unsuccessful.

If a subsequent valid or invalid digit is not received before the inter-digit timer expires and the number of received valid digits is greater than the "minimumNbOfDigits", and less than or equal to the "maximumNbOfDigits", the input is regarded to be successful.

If the "interDigitTimeOut" is not present, then the gsmSRF uses a default value for the inter-digit timer.

- errorTreatment:

This optional parameter defines what specific action should be taken by the gsmSRF in the event of error conditions occurring. The default value is stdErrorAndInfo.

- interruptableAnnInd:

This parameter is optional, where the default value is TRUE.

If this parameter is TRUE, the announcement is interrupted after the first valid or invalid digit is received by the gsmSRF. If the announcement is interrupted, a possible start-digit timer will not apply anymore. However, if the announcement has not been interrupted, a possible start-digit timer is started after the announcement has been finished.

If this parameter is present and explicitly set to FALSE, the announcement will not be interrupted after the first digit is received by the gsmSRF. The received digits during the announcement are discarded and considered to be invalid. All other specified parameters ("minimumNbOfDigits", "maximumNbOfDigits", "endOfReplyDigit", etc.) do not apply before the announcement has been finished. The possible start-digit timer is started after the announcement has been finished.

- voiceInformation:

This parameter is optional, where the default value is FALSE. If the "voiceInformation" parameter is FALSE, all valid or invalid digits are entered by DTMF.

If this parameter is present and explicitly set to TRUE, the calling user is required to provide all valid or invalid information by speech. The gsmSRF will perform voice recognition and translation of the provided information into digits. A possible end of reply digit will also have to be provided by speech.

- voiceBack:

This parameter is optional, where the default value is FALSE. If the "voiceBack" parameter is FALSE, no voice back information is given by the gsmSRF.

If this parameter is present and explicitly set to TRUE, the valid input digits received by the gsmSRF will be announced back to the calling user immediately after the end of input is received. The invalid input digits will not be announced back to the calling user. A possible end of reply digit is not voiced back.

- disconnectFromIPForbidden:

This parameter indicates whether the gsmSRF should initiate disconnection to the gsmSSF after the interaction has been completed. If the parameter is not present or set to TRUE, the gsmSRF shall not initiate disconnection.

- informationToSend:

This parameter indicates an announcement or tone to be sent to the end user by the gsmSRF.

- inbandInfo:

This parameter specifies the inband information to be sent.

- messageID:

This parameter indicates the message(s) to be sent, this can be one of the following:

- elementaryMessageID:

This parameter indicates a single announcement.

- text:

This parameter indicates a text to be sent. The text shall be transformed to inband information (speech) by the gsmSRF. The attributes of text may consist of items such as language.

- elementaryMessageIDs:

This parameter specifies a sequence of announcements.

- variableMessage:

This parameter specifies an announcement with one or more variable parts.

- numberOfRepetitions:

This parameter indicates the maximum number of times the message shall be sent to the end-user.

- duration:

This parameter indicates the maximum time duration in seconds that the message shall be played/repeated. ZERO indicates endless repetition.

- interval:

This parameter indicates the time interval in seconds between repetitions, i.e. the time between the end of the announcement and the start of the next repetition. This parameter can only be used when the number of repetitions is greater than one.

- tone:

This parameter specifies a tone to be sent to the end-user.

- toneID:

This parameter indicates the tone to be sent.

- duration:

This parameter indicates the time duration in seconds of the tone to be sent. ZERO indicates infinite duration.

Result Parameter:

- digitsResponse:

This parameter contains the information collected from the end-user.

11.34.2 Responding entity (gsmSRF)

11.34.2.1 Normal procedure

gsmSRF precondition:

- (1) The SRSM-FSM is in the state "Connected", or in state "User Interaction" if the gsmSRF received previously an operation from the gsmSCF.

gsmSRF postcondition:

- (1) The gsmSRF has sent the information to the end-user as indicated by "informationToSend".
- (2) The collected information from the end-user is sent to the gsmSCF as RETURN RESULT of the "PromptAndCollectUserInformation".
- (3) If the "disconnectFromIPForbidden" was set to FALSE, the gsmSRF initiates a bearer channel disconnect to the gsmSSF and the SRSM FSM moves to the state "Idle".
- (4) Otherwise the SRSM FSM moves to the state "User Interaction", or remains in the same state..

The announcement send to the end-user is ended in the following conditions:

- if neither "duration" or "numberOfRepetitions" is specified, then the network specific announcement ending conditions shall apply; or
- if "numberOfRepetitions" is specified, when all repetitions have been sent, or
- if duration is specified, when the duration has expired. The announcement is repeated until this condition is met, or
- if "duration" and "numberOfRepetitions" is specified, when one of both conditions is satisfied (whatever comes first).

The above conditions are overruled if the parameter "interruptableAnnInd" is not set to FALSE and the end-user has responded with a digit during the sending of the announcement. In this case the announcement is ended immediately. The above procedures apply only to inband information and tones send to the end-user, for "displayInformation" the end conditions are met upon sending, i.e. no interruption can occur.

The parameter "errorTreatment" specifies how the gsmSRF shall treat the error. The default value "reportErrorToSCF" means that the error shall be reported to gsmSCF by means of Return Error with "ImproperCallerResponse". The value "help" indicates that no error shall be reported to gsmSCF but assistance shall be given to the end-user in form of a network dependent default announcement (which may dependent on the context, i.e. the send message). The value "repeatPrompt" indicates that no error shall be reported to the gsmSCF but the prompt shall be repeated to the end-user. The last two procedures shall only be done once per "PromptAndCollectUserInformation" operation.

The Prompt and Collect User Information procedure shall not be used for User Interaction during the Active Phase of the call.

Note on processing "endOfInput"

The receipt of any "endOfInput" condition (e.g endOfReplyDigit, cancelDigit, firstDigitTimeout, interDigitTimeout) terminates immediately the ongoing input. In other words when e.g an endOfReplyDigit is received, the receipt of a subsequent cancelDigit will not be processed anymore.

11.34.2.2 Error handling

If a Cancel operation is received before or during the processing of the operation then the operation is immediately cancelled and the error "Canceled" is reported to the invoking entity.

Generic error handling for the operation related errors are described in clause 17, the TC services which are used for reporting operation errors are described in clause 19.

If any of the parameter restrictions are violated (e.g. minimumNbOfDigits > maximumNbOfDigits) then an operation error has occurred.

