3GPP TSG CN Plenary **Tdoc NP-010088**
Meeting #11, Palm Springs, U.S.A
14th - 16th March 2001

Source: **TSG CN WG4**

Title: **CRs to Rel-4 on Work Item TEI**

Agenda item: **8.16**

Document for: **APPROVAL**

Introduction:

This document contains **6** CRs on **Rel-4** Work Item **"TEI"**, that have been agreed by **TSG CN WG4**, and are forwarded to TSG CN Plenary meeting #11 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.084	003		N4-010024	Rel-4	Enhancement of MPTY SDLs and CAMEL functionality	C	3.2.0
23.091	003		N4-010025	Rel-4	Enhancement of ECT SDLs and CAMEL functionality	C	3.2.0
23.018	065	1	N4-010355	Rel-4	Incorporation of MPTY and ECT into the Subs_FSM process	C	4.1.0
23.018	067		N4-010357	Rel-4	Removal of CW descriptions	C	4.1.0
23.083	007		N4-010358	Rel-4	Enhancement of CW procedures	C	4.0.0
23.083	006	2	N4-010426	Rel-4	Enhancement of procedures for Call Hold	C	4.0.0

3GPP TSG-CN4 Meeting #07
Sophia Antipolis, France, 26/2-2/3/01

Tdoc N4-010355

CR-Form-v3

CHANGE REQUEST

⌘ **23.018** **CR** **065** ⌘ rev **1** ⌘ Current version: **4.1.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Incorporation of MPTY and ECT into the Subs_FSM process.
Source:	⌘	CN4
Work item code:	⌘	TEI
Date:	⌘	13/12/00
Category:	⌘	**C**
Release:	⌘	REL-4

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

Use one of the following releases:

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

Reason for change:	⌘	The handling of the supplementary services MPTY and ECT is currently undefined in 23.018.
Summary of change:	⌘	The Subs_FSM process has been updated quite considerably in order to incorporate MPTY and ECT. Also, the procedure Send_Alerting_If_Required has been updated in order for it to send notification when an outgoing call leg is in the "Alerting" state. Also, some enhancements to the definition of HOLD and CW in the MO and MT cases have been made in procedure OG_Call_Setup and process ICH_MSC (respectively).
Consequences if not approved:	⌘	

Clauses affected:	⌘	2, 7.1.1, 7.3.1, 7.4			
Other specs affected:	⌘	**X**	Other core specifications	⌘	CR 23.083-006, CR 23.084-003, CR 23.091-003
		☐	Test specifications		
		☐	O&M Specifications		
Other comments:	⌘	Although *all* the SDL diagrams in the Subs_FSM process have been replaced by a new one, a good number of them have only had "cosmetic" changes made to them such as the re-formatting of the text in the signal description box in the top right corner and the removal of some underscores ("_") in variable names where they span multiple lines.			

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

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1999 document, references to 3G Technical Specifications are for Release 1999 versions (version 3.x.y).

[1] 3GPP~~GSM 0~~4~~3~~.0~~2~~0: "~~Digital cellular telecommunications system (Phase 2+);~~ Security related network functions".

[2] 3GPP TS 48.008: "~~Digital cellular telecommunications system (Phase 2+);~~ Mobile-services Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification".

[3] GSM 12.08: "Digital cellular telecommunications system (Phase 2+); Subscriber and equipment trace (GSM 12.08)".

. . .

[16] 3GPP TS 23.083: "Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 2".

[17] 3GPP TS 23.084: "~~Digital cellular telecommunications system (Phase 2+);~~ Multi Party (MPTY) Supplementary Service - Stage 2".

[18] 3GPP TS 23.085: "Closed User Group (CUG) Supplementary Service - Stage 2".

[19] 3GPP TS 23.086: "Advice of Charge (AoC) Supplementary Service - Stage 2".

[20] 3GPP TS 23.087: "User –to-User Signalling (UUS) - Stage 2".

[21] 3GPP TS 23.088: "Call Barring (CB) Supplementary Service - Stage 2".

[22] 3GPP TS 23.091: “Explicit Call Transfer (ECT) supplementary service - Stage 2”

[2~~2~~3] 3GPP TS 23.093: "Technical realisation of Completion of Calls to Busy Subscriber (CCBS) - Stage 2".

[2~~3~~4] 3GPP TS 23.116: "Super-Charger Technical Realisation; Stage 2".

[2~~4~~5] 3GPP TS 23.135: "Multicall supplementary service; Technical Realisation; Stage 2".

[2~~5~~6] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[2~~6~~7] 3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling".

[2~~7~~8] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[298] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[3029] 3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[310] 3GPP TS 29.010: "Information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC) Signalling procedures and the Mobile Application Part (MAP)".

[321] 3GPP TS 33.102: "3G Security; Security Architecture ".

[332] ITU-T Q.761, December 1999: "Specifications of Signalling System No. 7 – Functional description of the ISDN user part of Signalling System No. 7".

[343] ITU-T Q.762, December 1999: "Specifications of Signalling System No. 7 – General function of messages and signals of the ISDN user part".

[354] ITU-T Q.763, December 1999: "Specifications of Signalling System No. 7 – Formats and codes of the ISDN user part".

[365] ITU-T Q.764, December 1999: "Specifications of Signalling System No. 7 – Signalling System No. 7 – ISDN user part signalling procedures".

[376] ITU-T Recommendation Q.850 (1996): "Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part".

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

7 Functional requirements of network entities

7.1 MO call

7.1.1 Functional requirements of serving MSC

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 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 3GPP TS 23.087 [20].

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 3GPP TS 27.001 [28].

Sheet 1: the procedure CAMEL_N_CSI_CHECK_MSC is specific to CAMEL Phase 3 or later, it is specified in 3GPP TS 23.078 [12].

Sheet 1: the procedure Check_OG_Multicall_MSC is specific to Multicall; it is specified in 3GPP TS 23.135 [25]. If the VMSC does not support Multicall, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 1: the variable “On_Hold” is used only if the VMSC supports Call Hold.

Sheet 1, sheet 2, sheet 3, sheet 6: the procedure CCBS_OCH_Report_Failure is specific to CCBS; it is specified in 3GPP TS 23.093 [23].

Sheet 1, sheet 2, sheet 6, sheet 7, sheet 9: at any stage after the Set-up has been received, the MS may terminate the transaction with the network by sending a Release transaction request.

. . .

Sheet 4, sheet 7: the procedures CAMEL_Start_TNRy and CAMEL_Stop_TNRy are specific to CAMEL phase 2 or later; they are specified in 3GPP TS 23.078 [12].

Sheet 4: the task "UTU2Cnt := 0" is executed only if the VMSC supports UUS

Sheet 5: the procedure CAMEL_OCH_MSC_ANSWER is specific to CAMEL; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 5: the procedure Set_COLP_Info_MSC is specific to COLP.

Sheet 5: the procedure Handle_AoC_MO_MSC is specific to AoC.

Sheet 5: the task "Store CW treatment indicator for this call if received in SII2" is executed only if the VMSC supports CAMEL phase 3 or later.

. . .

Sheet 9: the procedure CAMEL_OCH_MSC_DISC1 is specific to CAMEL; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL, processing continues from the "No" exit of the test "Result=CAMEL handling?".

Sheet 9: the procedure CAMEL_OCH_MSC_DISC2 is specific to CAMEL; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL, processing continues from the "No" exit of the test "Result=CAMEL handling?".

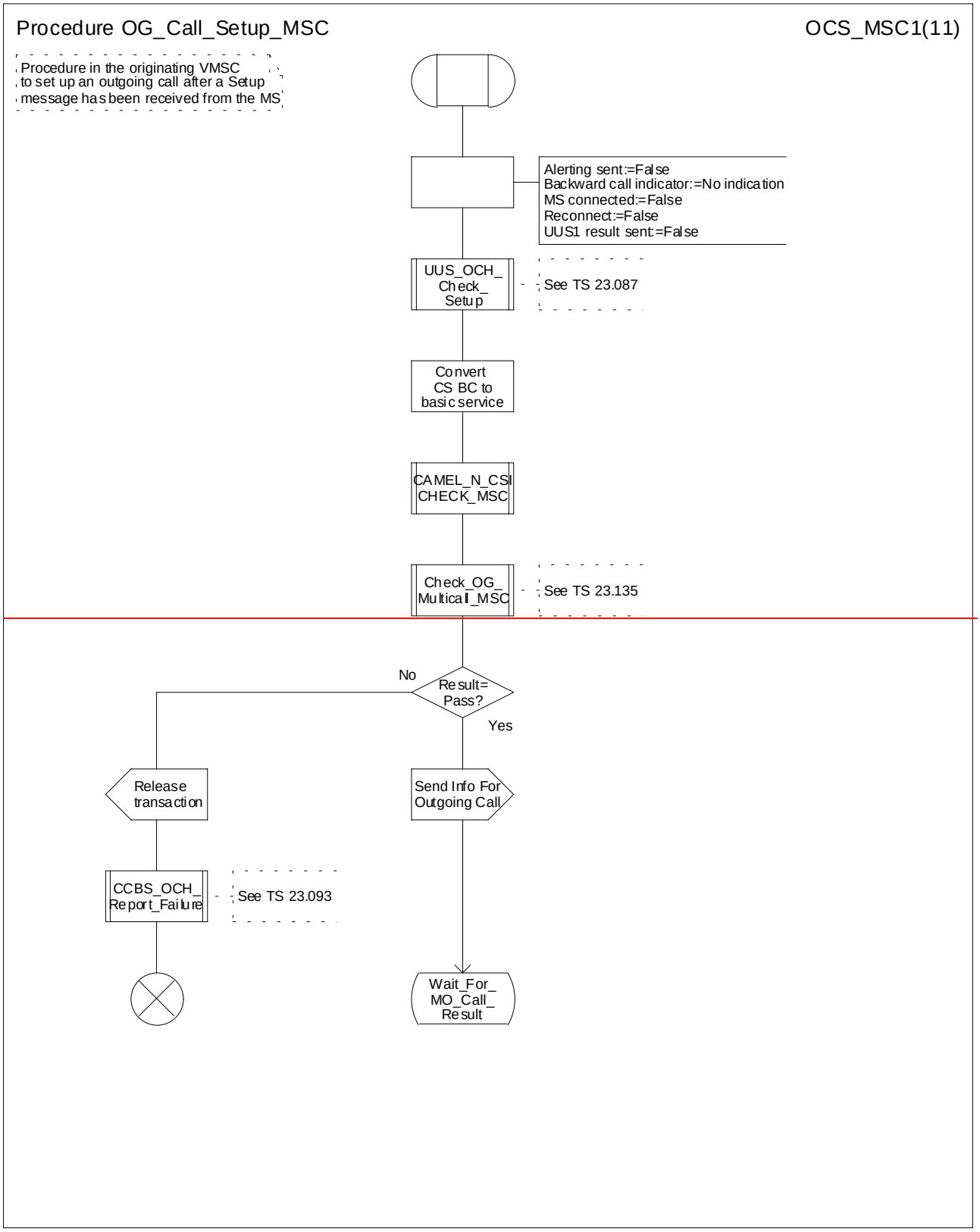
Sheet 10: the procedure Process_Hold_Request is specific to Call Hold; it is specified in 3GPP TS 23.083[16]. ~~If the VMSC does not support Call Hold, processing continues from the "False" exit of the test "Result=Hold Allowed?".~~

Sheet 1~~0~~1: ~~the processing on this sheet is specific to Call Hold, and will occur only if the VMSC supports Call Hold.~~ ~~T~~the procedure Process_Retrieve_request is specific to Call Hold; it is specified in 3GPP TS 23.083[16].

. . .

7.1.1.14 Procedure TCH_Check

~~Signals are sent to and received from the process Subs_FSM as described in subclause 7.4.~~


Procedure OG_Call_Setup_MSC
OCS_MSC1(11)
Procedure in the originating VMSC to set up an outgoing call after a Setup message has been received from the MS
Alerting sent:=False
Backward call indicator:=No indication
MS connected:=False
Reconnect:=False
UUS1 result sent:=False
UUS_OCH_ Check_ Setup
See TS 23.087
Convert CS BC to basic service
CAMEL_N_CSI CHECK_MSC
Check_OG_ Multicall_MSC
See TS 23.135
No
Result= Pass?
Yes
Release transaction
Send Info For Outgoing Call
CCBS_OCH_ Report_Failure
See TS 23.093
Wait_For_ MO_Call_ Result

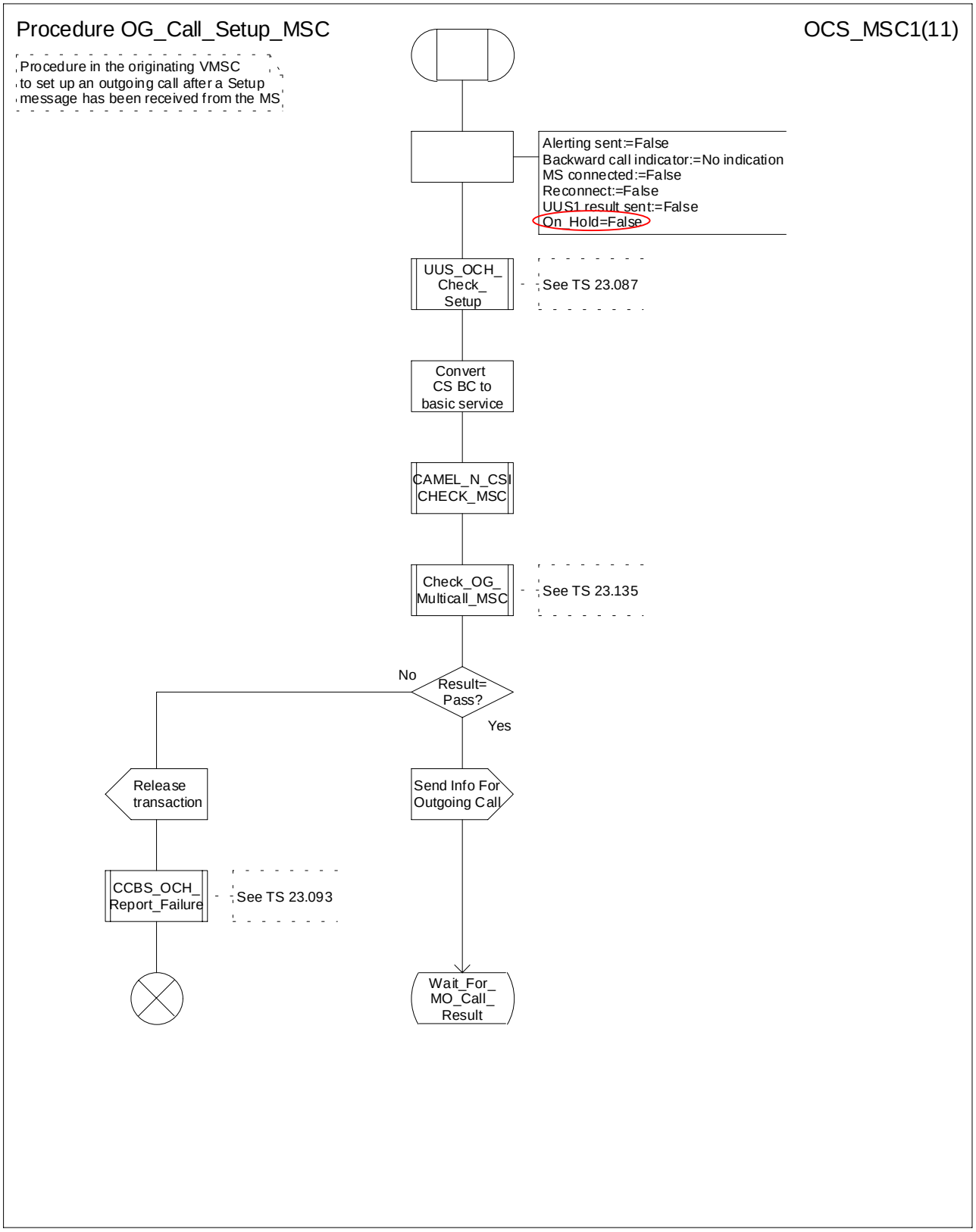
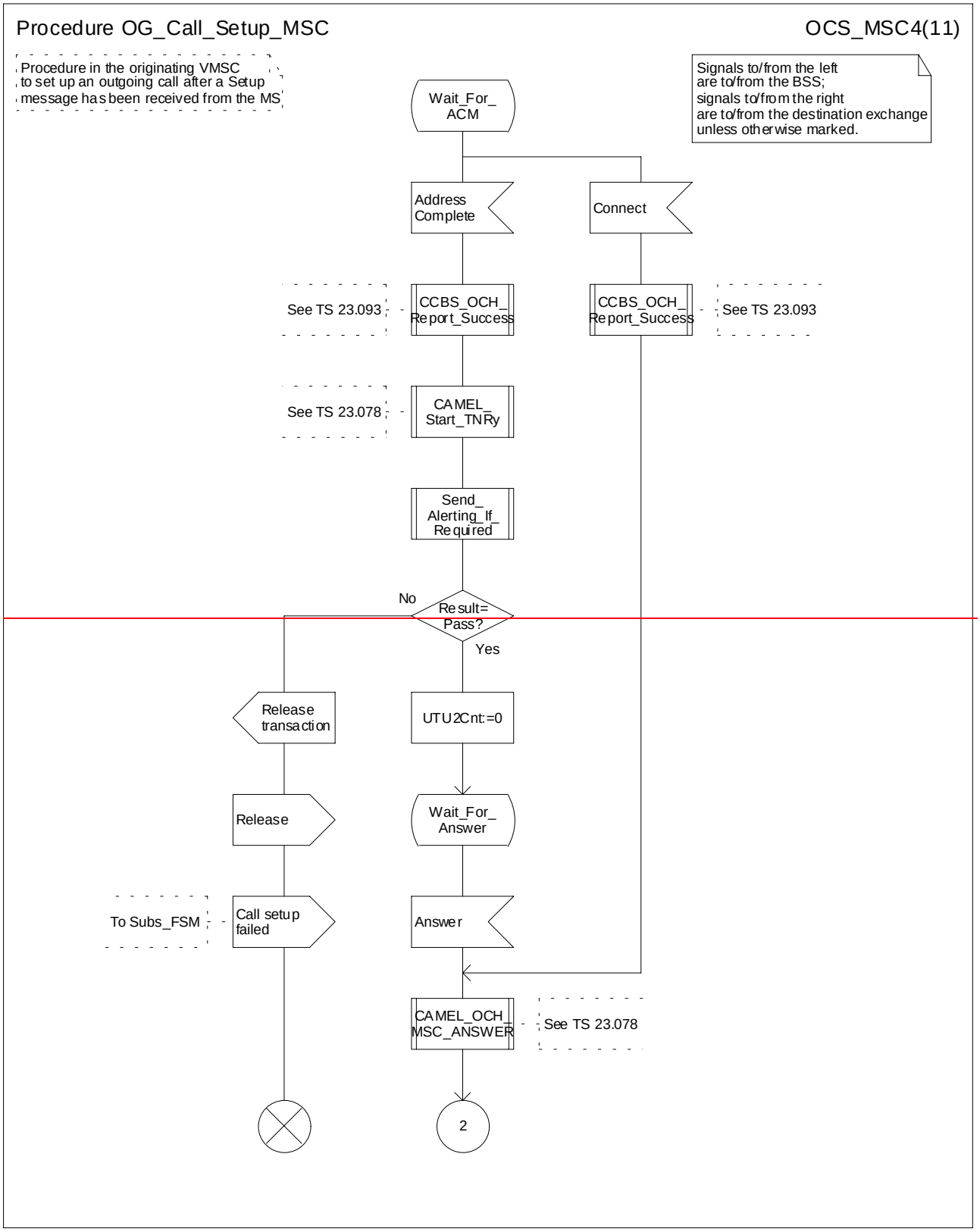


Figure 1a: Procedure OG~~utgoing~~_Call_Setup_MSC (sheet 1)


Procedure OG_Call_Setup_MSC
OCS_MSC4(11)
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 unless otherwise marked.
Wait_For_ ACM
Address Complete
Connect
See TS 23.093
CCBS_OCH_ Report_Success
CCBS_OCH_ Report_Success
See TS 23.093
See TS 23.078
CAMEL_ Start_TNRy
Send_ Alerting_If_ Required
No
Result= Pass?
Yes
Release transaction
UTU2Cnt:=0
Release
Wait_For_ Answer
To Subs_FSM
Call setup failed
Answer
CAMEL_OCH_ MSC_ANSWER
See TS 23.078
2

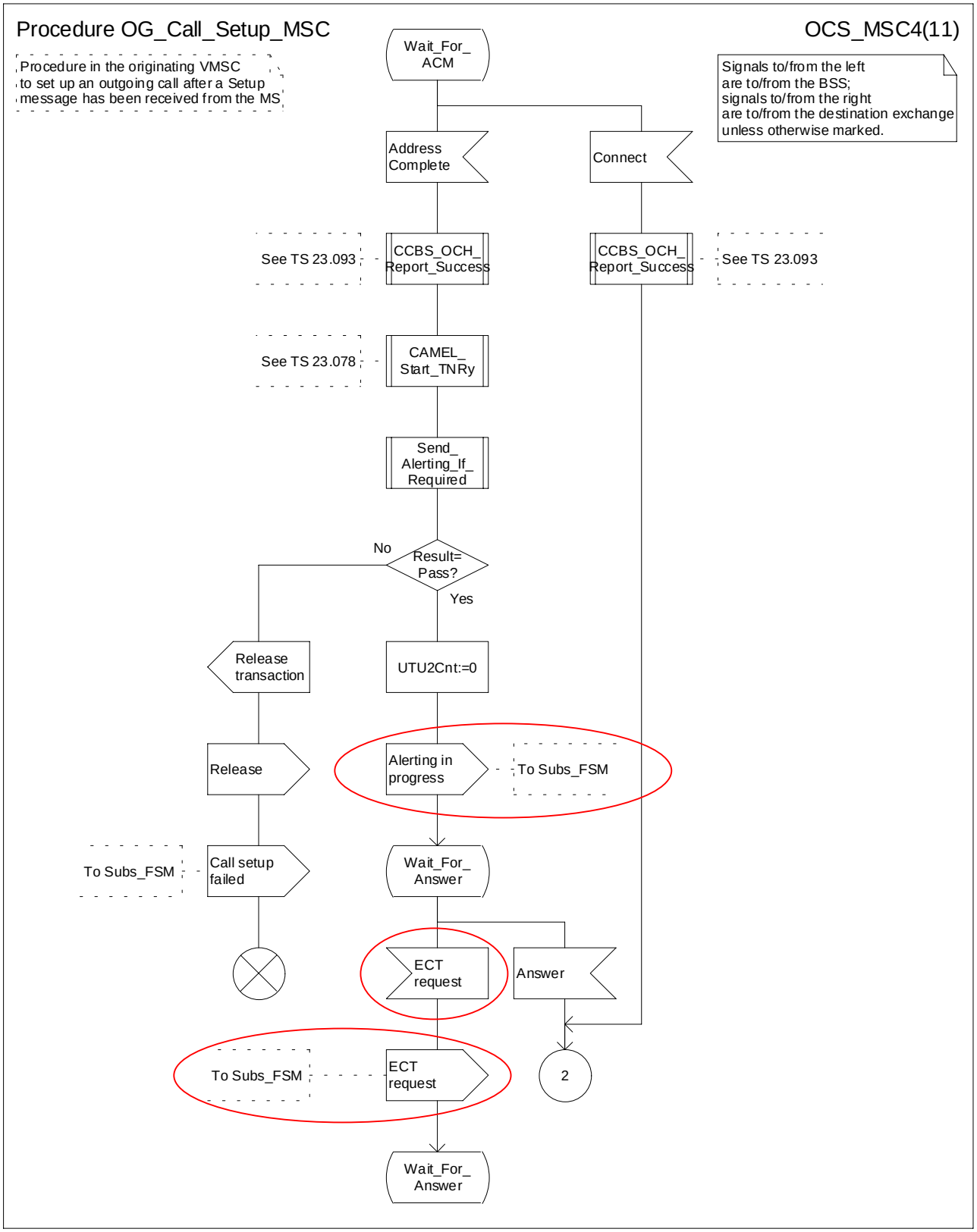
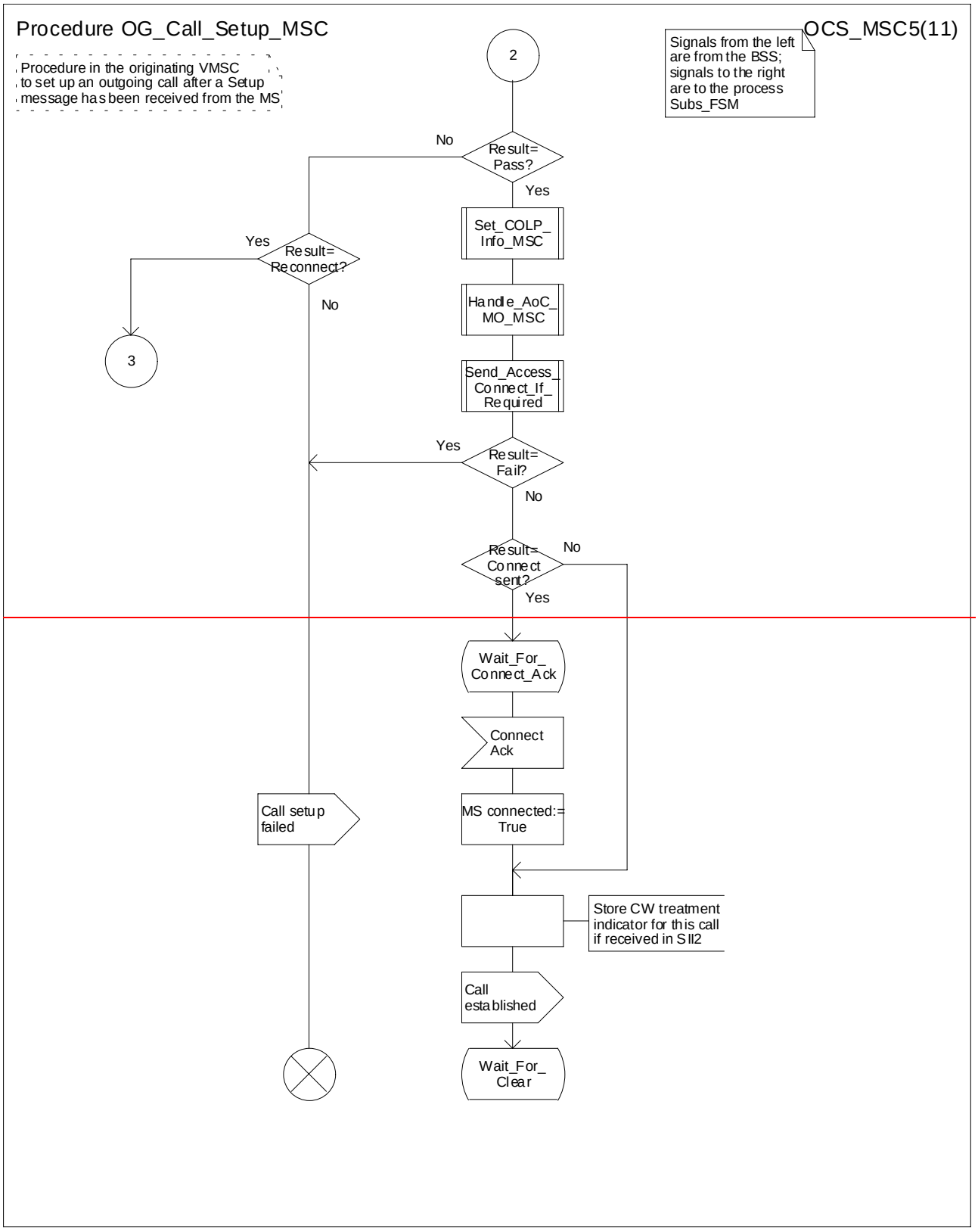


Figure 8d: Procedure O~~G~~utgoing_Call_Setup _MSC (sheet 4)


Procedure OG_Call_Setup_MSC
OCS_MSC5(11)
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; signals to the right are to the process Subs_FSM
2
Result= Pass?
No
Yes
Set_COLP_ Info_MSC
Handle_AoC_ MO_MSC
Send_Access_ Connect_If_ Required
Result= Fail?
Yes
No
Result= Connect sent?
No
Yes
Wait_For_ Connect_Ack
Connect Ack
MS connected:= True
Store CW treatment indicator for this call if received in SII2
Call established
Wait_For_ Clear
Result= Reconnect?
Yes
No
3
Call setup failed

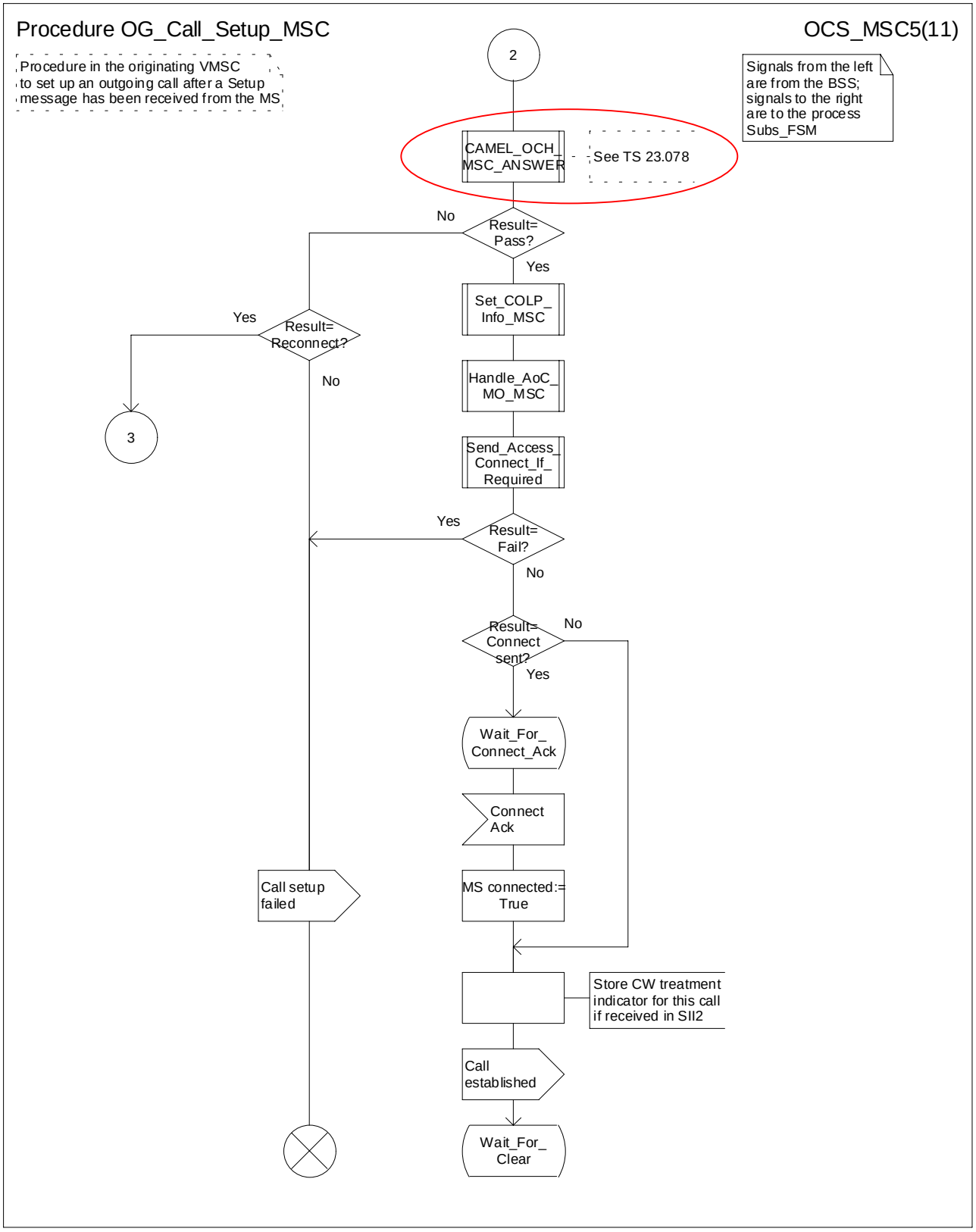
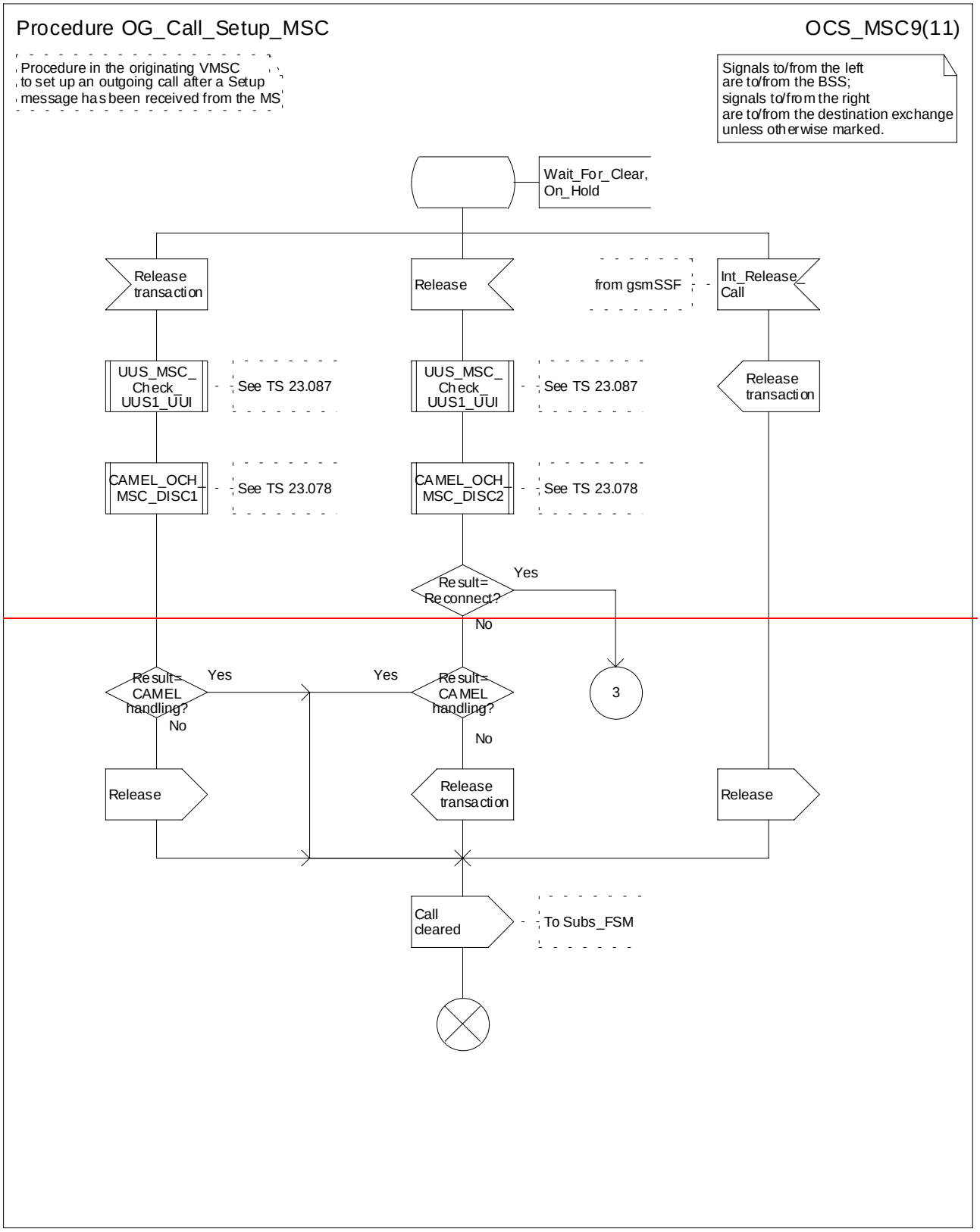


Figure 8e: Procedure O~~G~~utgoing_Call_Setup _MSC (sheet 5)

. . .


Procedure OG_Call_Setup_MSC
OCS_MSC9(11)
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 unless otherwise marked.
Wait_For_Clear, On_Hold
Release transaction
Release
from gsmSSF
Int_Release_Call
UUS_MSC_Check_UUS1_UUI
See TS 23.087
UUS_MSC_Check_UUS1_UUI
See TS 23.087
Release transaction
CAMEL_OCH_MSC_DISC1
See TS 23.078
CAMEL_OCH_MSC_DISC2
See TS 23.078
Result= Reconnect?
Yes
No
Result= CAMEL handling?
Yes
Yes
Result= CAMEL handling?
3
No
No
Release
Release transaction
Release
Call cleared
To Subs_FSM

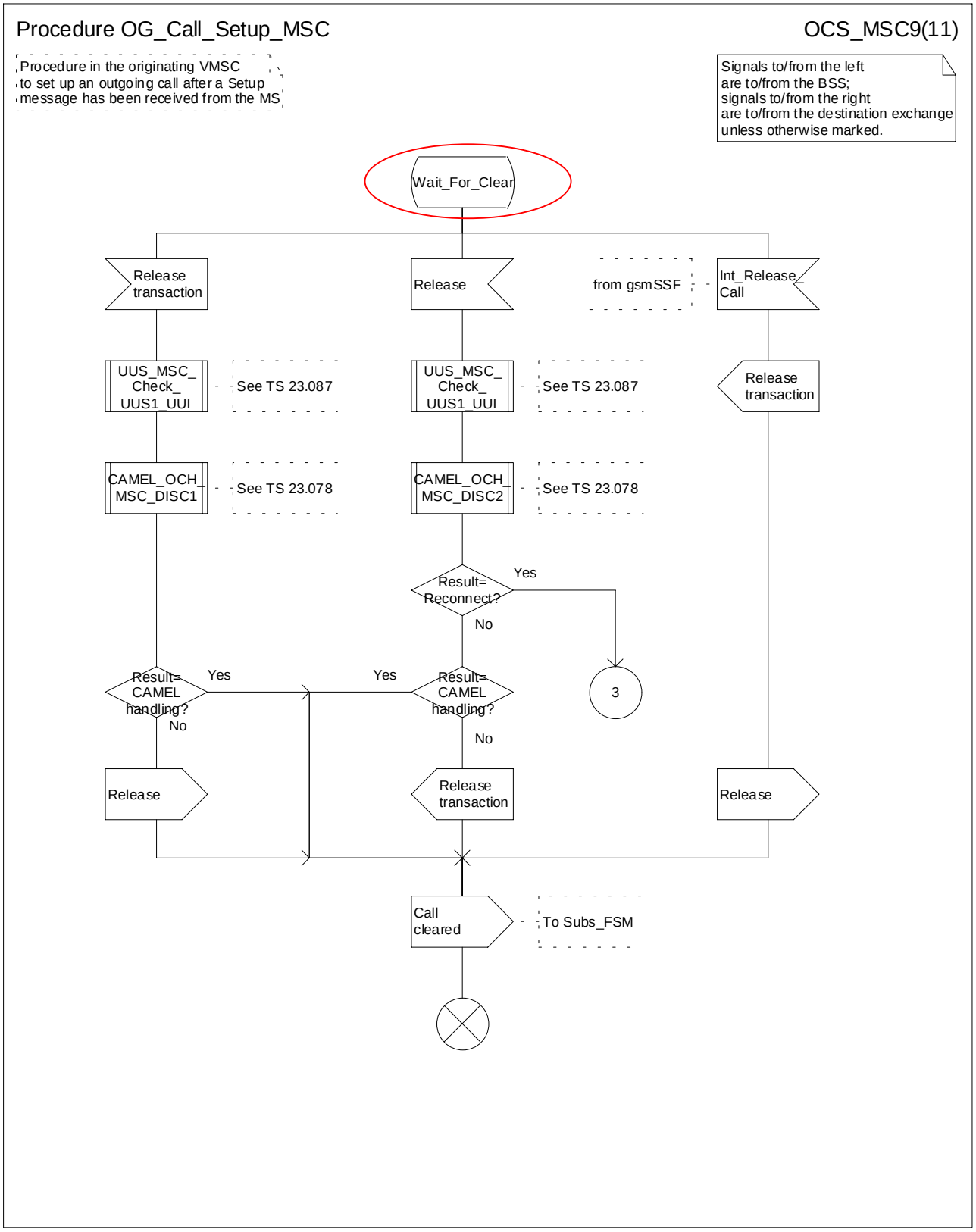
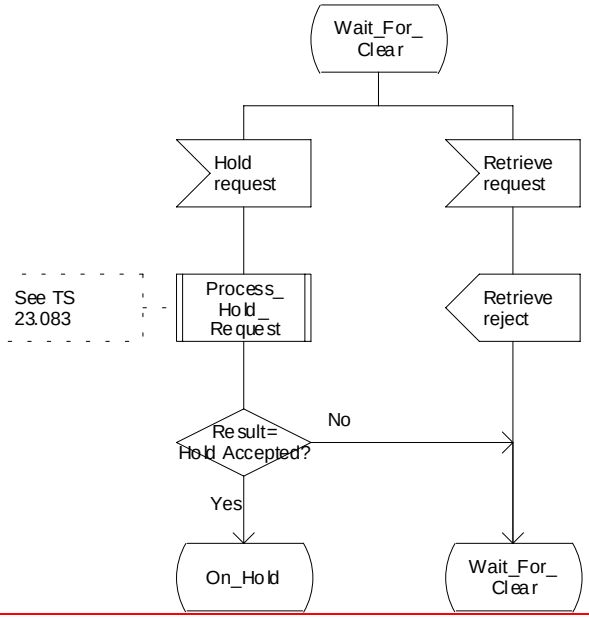


Figure 8i: Procedure O~~G~~utgoing_Call_Setup _MSC (sheet 9)

Procedure OG_Call_Setup_MSC OCS_MSC10(11)

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



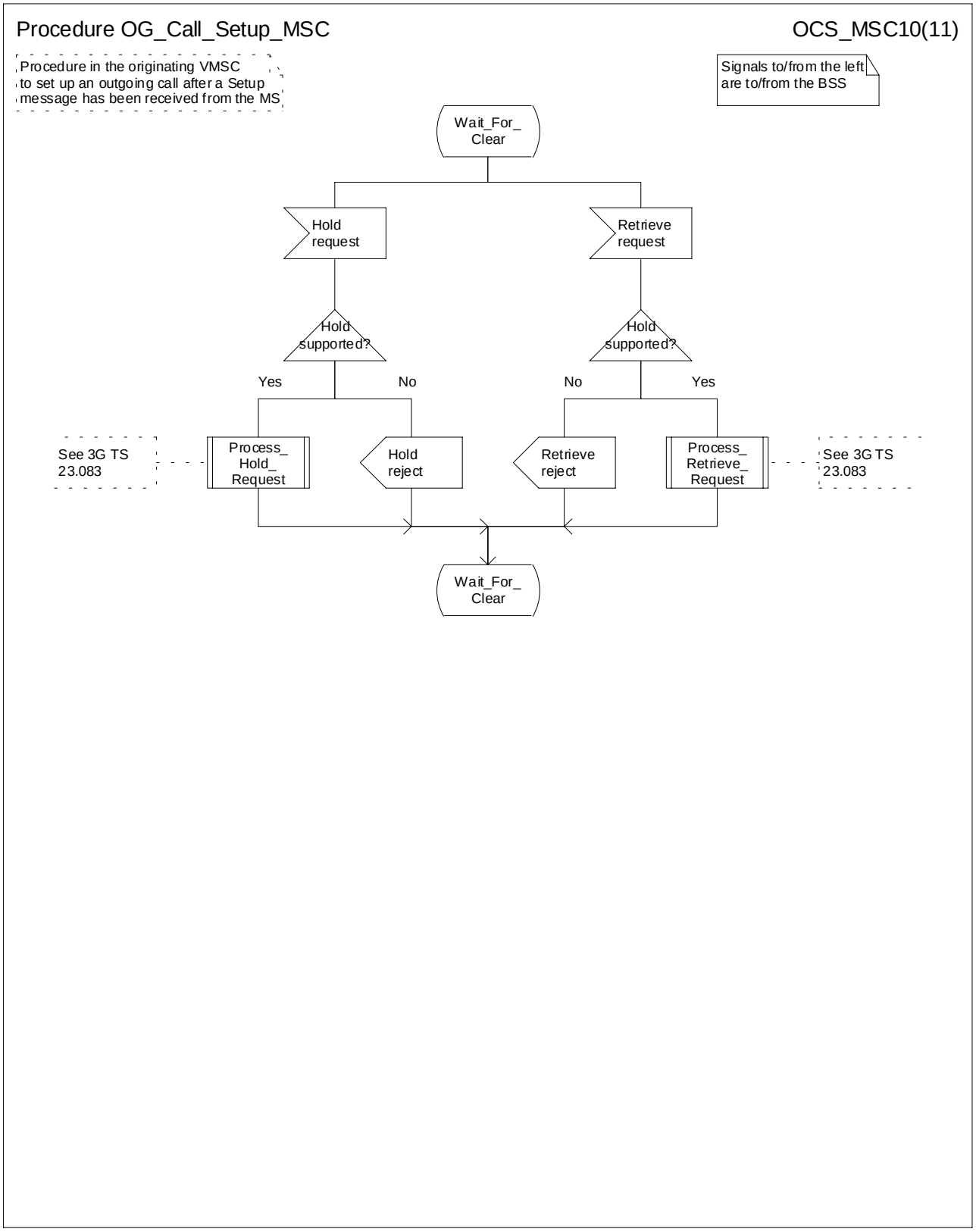
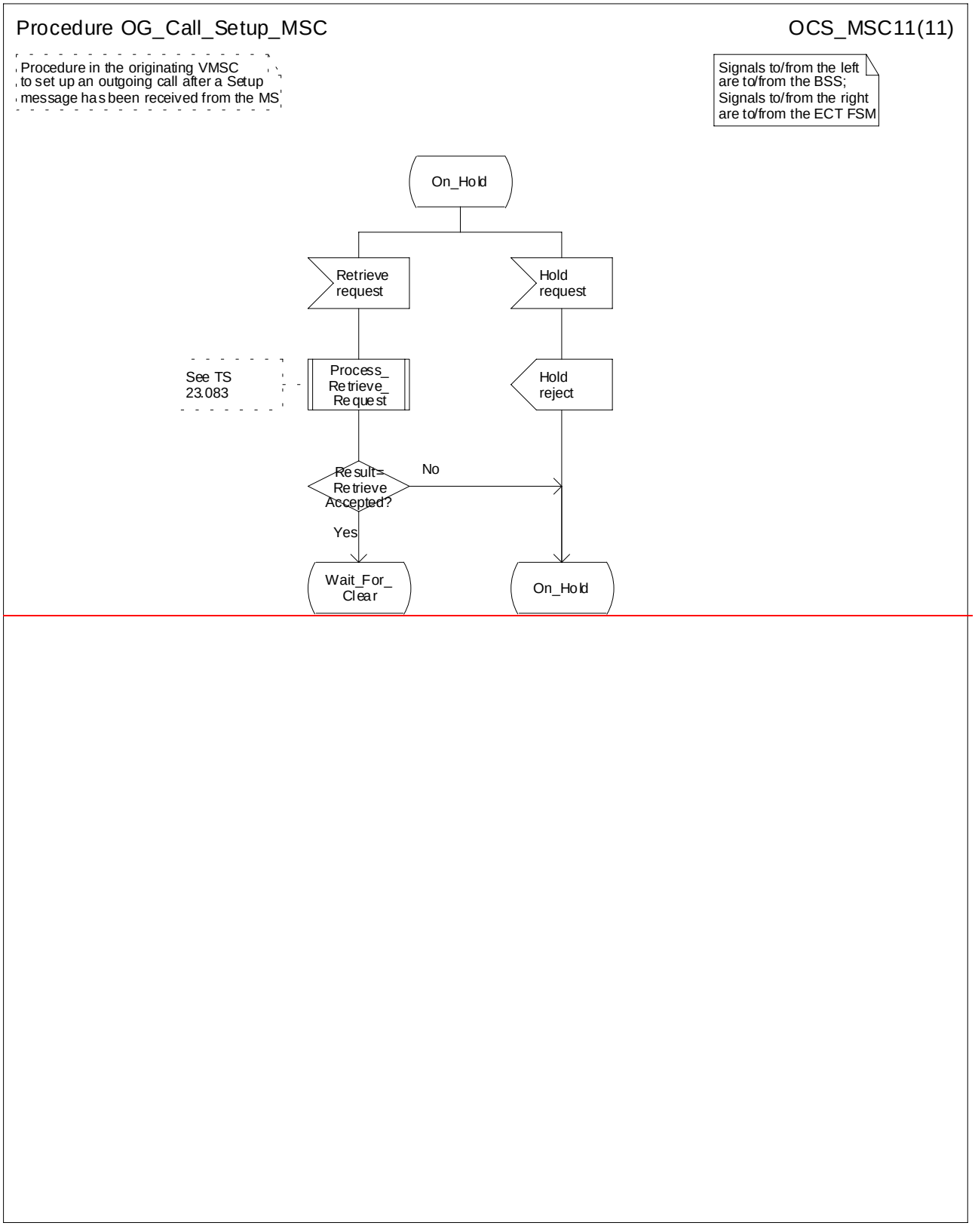


Figure 8j: Procedure OG~~utgoing~~_Call_Setup _MSC (sheet 10)


Procedure OG_Call_Setup_MSC
OCS_MSC11(11)
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 ECT FSM
On_Hold
Retrieve request
Hold request
See TS 23.083
Process_ Retrieve_ Request
Hold reject
Result= Retrieve Accepted?
No
Yes
Wait_For_ Clear
On_Hold

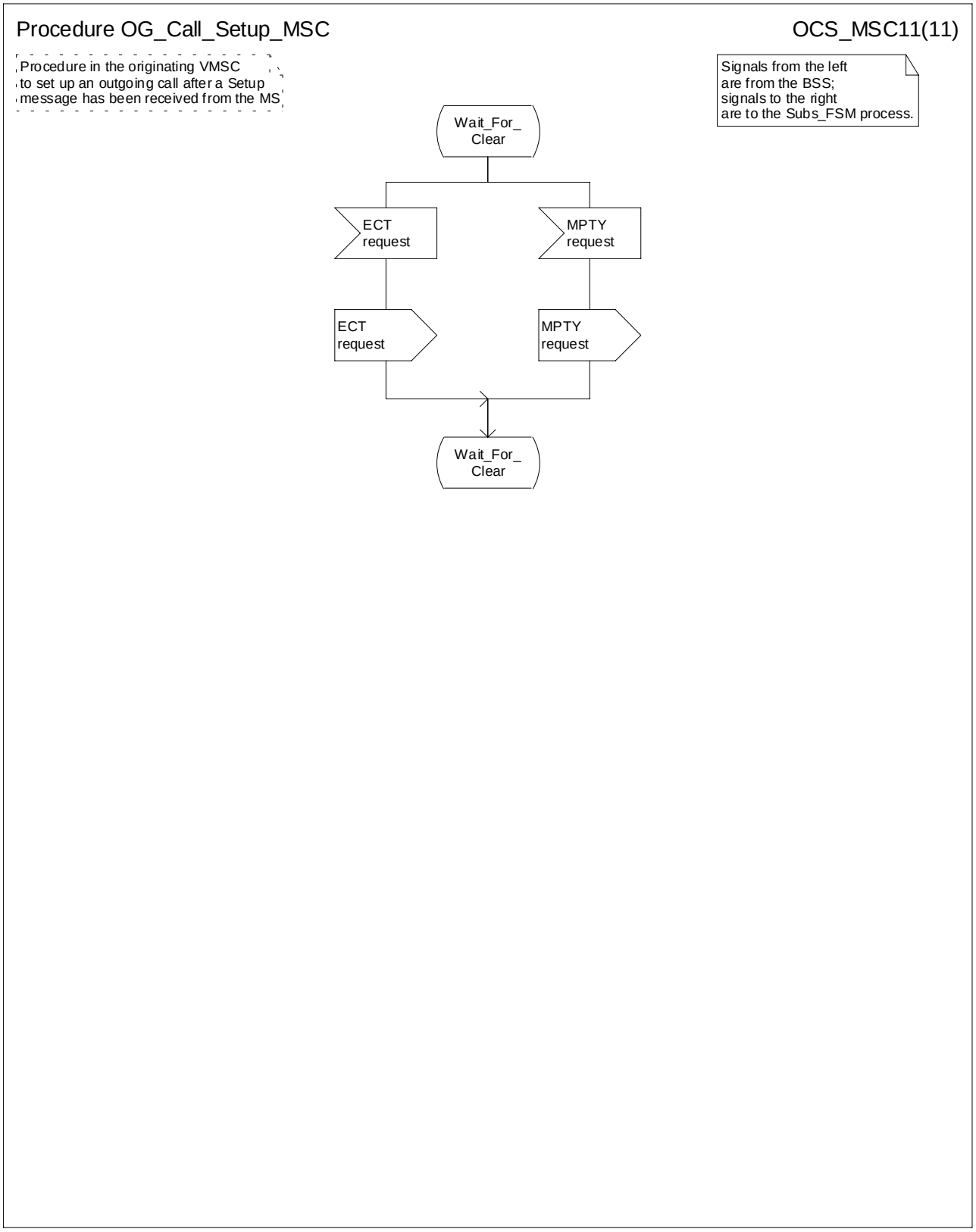
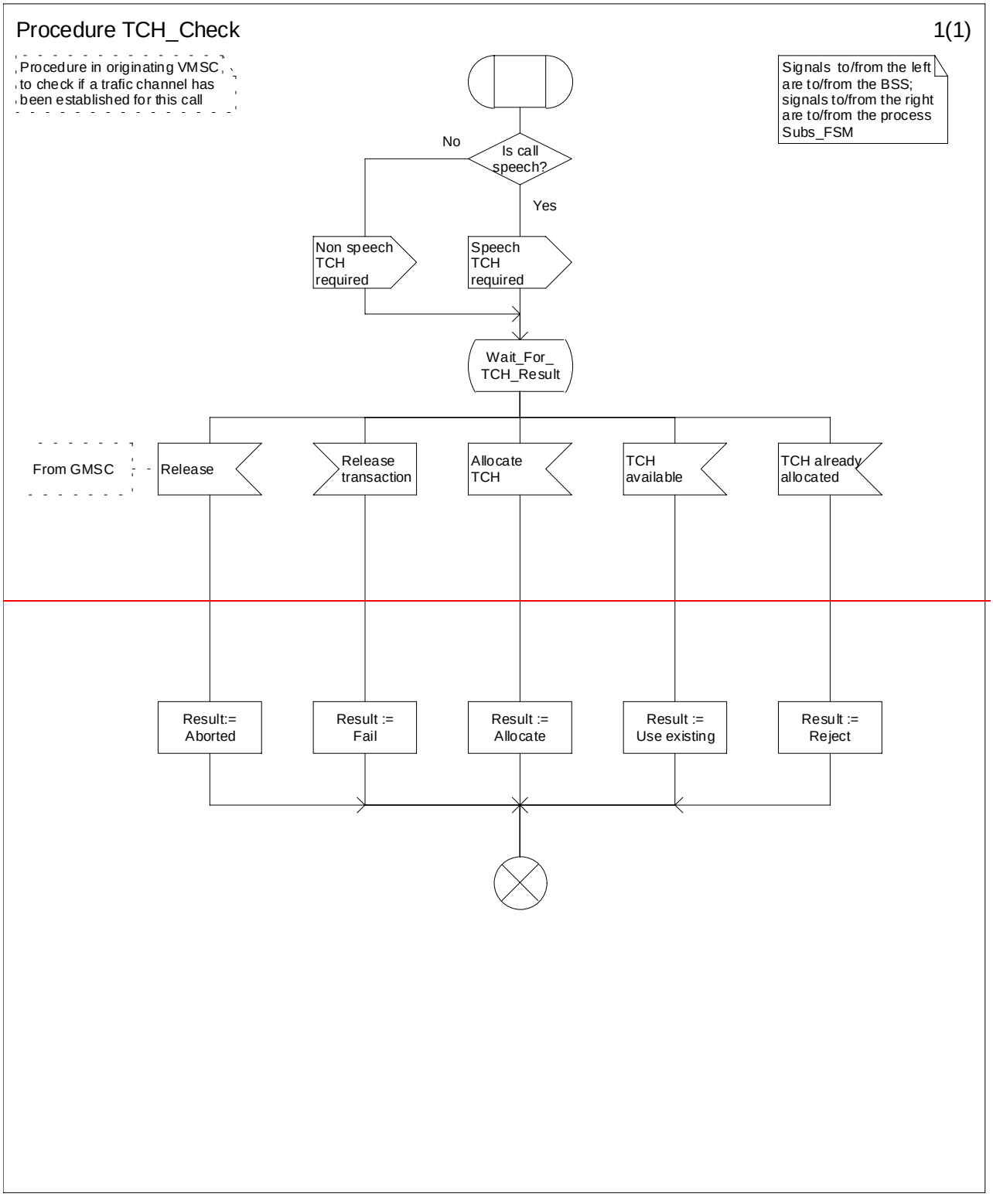


Figure 8k: Procedure O~~G~~utgoing _Call_Setup _MSC (sheet 11)

. . .


Procedure TCH_Check
1(1)
Procedure in originating VMSC to check if a trafic channel has been established for this call
Signals to/from the left are to/from the BSS; signals to/from the right are to/from the process Subs_FSM
Is call speech?
No
Yes
Non speech TCH required
Speech TCH required
Wait_For_ TCH_Result
From GMSC
Release
Release transaction
Allocate TCH
TCH available
TCH already allocated
Result:= Aborted
Result := Fail
Result := Allocate
Result := Use existing
Result := Reject

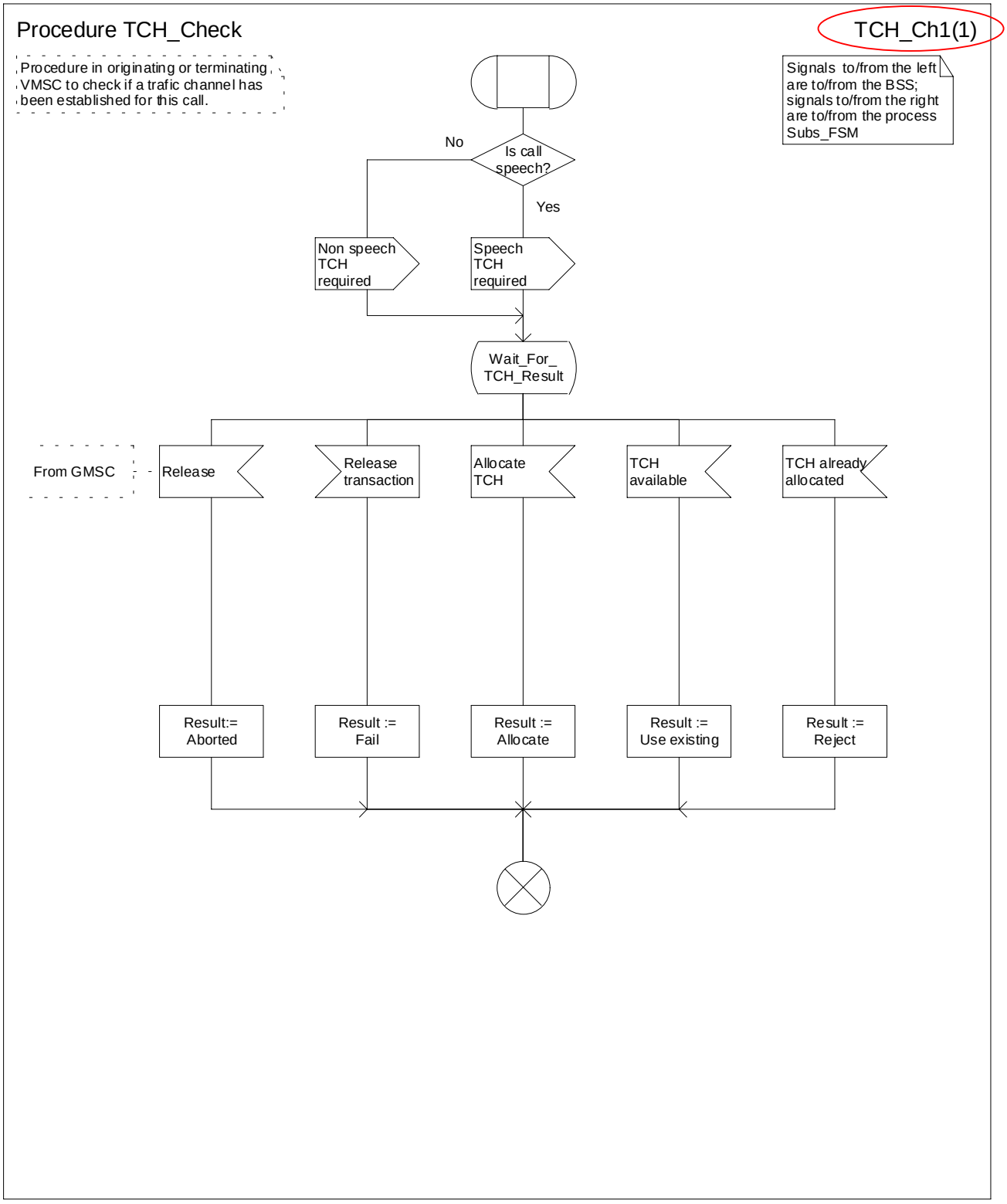


Figure 19: Procedure ~~OCH_VLR~~TCH_Check

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

7.3 MT call

7.3.1 Functional requirements of serving MSC

7.3.1.1 Process ICH_MSC

. . .

Sheet 1: the procedure CAMEL_ICH_MSC_INIT is specific to CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12].

Sheet 1: The variable “On_Hold” is used only if the VMSC supports Call Hold.

. . .

Sheet 11, sheet 12: the procedure CAMEL_MT_GMSC_DISC1 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12].

Sheet 11, sheet 12: the procedure CAMEL_MT_GMSC_ DISC2 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 11: the procedure UUS_MSC_Check_UUS1_UUI is specific to UUS; it is specified in 3GPP TS 23.087 [20].

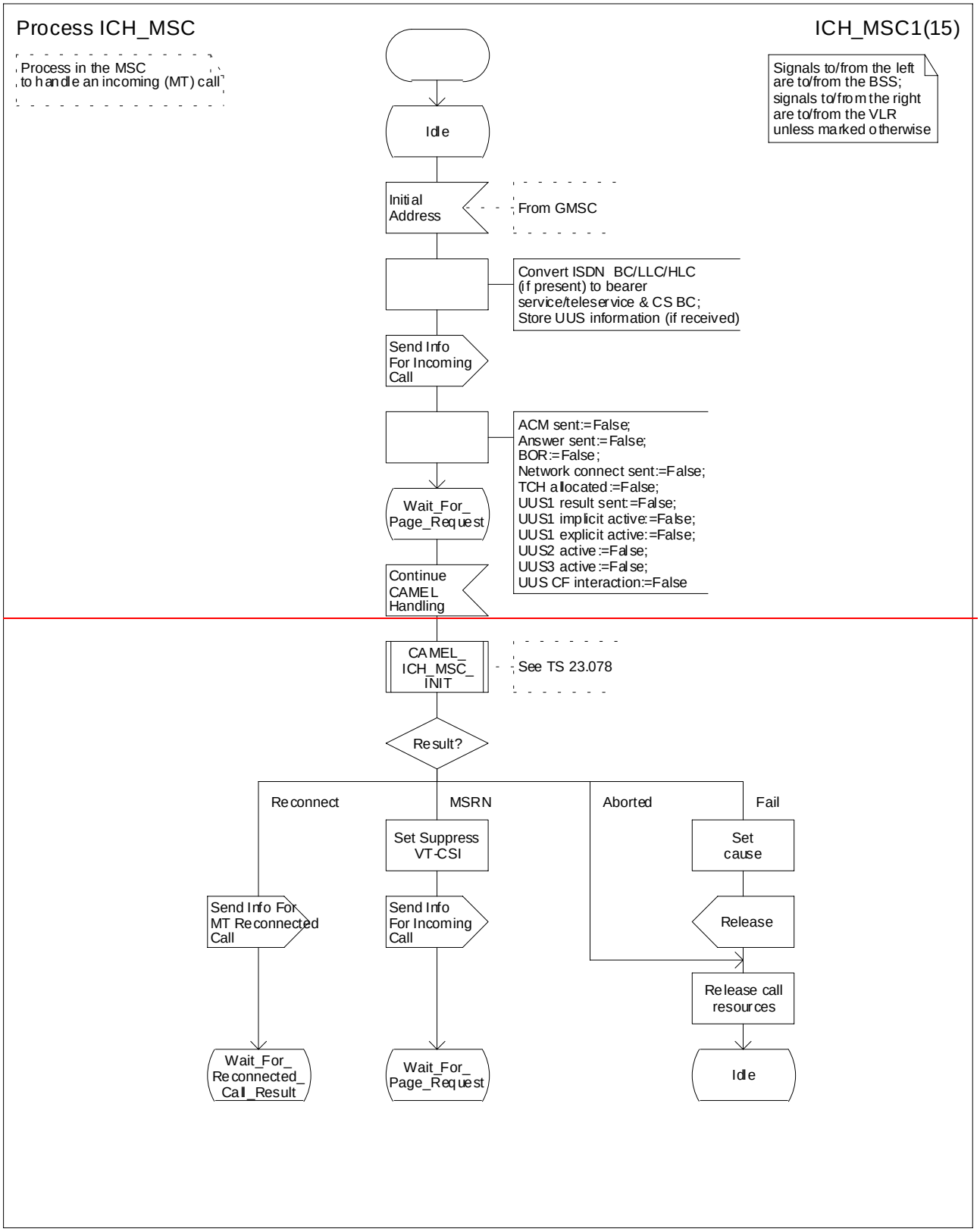
Sheet 12: after the VMSC has sent an IAM to the process MT_CF_MSC, it acts as a transparent relay for messages received from the GMSC and the process MT_CF_MSC. Any message other than Address Complete, Connect, Answer or Release causes no change of state in the process ICH_MSC.

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

Sheet 14: the procedure Process_Hold_Request is specific to Call Hold; it is specified in 3GPP TS 23.083[16].

Sheet 1~~5~~4: the procedure Process_Retrieve_request is specific to Call_Hold; it is specified in 3GPP TS 23.083[16].

. . .


Process ICH_MSC
ICH_MSC1(15)
Process in the MSC to handle an incoming (MT) call
Signals to/from the left are to/from the BSS; signals to/from the right are to/from the VLR unless marked otherwise
Idle
Initial Address
From GMSC
Convert ISDN BC/LLC/HLC (if present) to bearer service/teleservice & CS BC; Store UUS information (if received)
Send Info For Incoming Call
ACM sent:=False; Answer sent:=False; BOR:=False; Network connect sent:=False; TCH allocated:=False; UUS1 result sent:=False; UUS1 implicit active:=False; UUS1 explicit active:=False; UUS2 active:=False; UUS3 active:=False; UUS CF interaction:=False
Wait_For_ Page_Request
Continue CAMEL Handling
CAMEL_ ICH_MSC_ INIT
See TS 23.078
Result?
Reconnect
MSRN
Aborted
Fail
Set Suppress VT-CSI
Set cause
Send Info For MT Reconnected Call
Send Info For Incoming Call
Release
Release call resources
Wait_For_ Reconnected_ Call_Result
Wait_For_ Page_Request
Idle

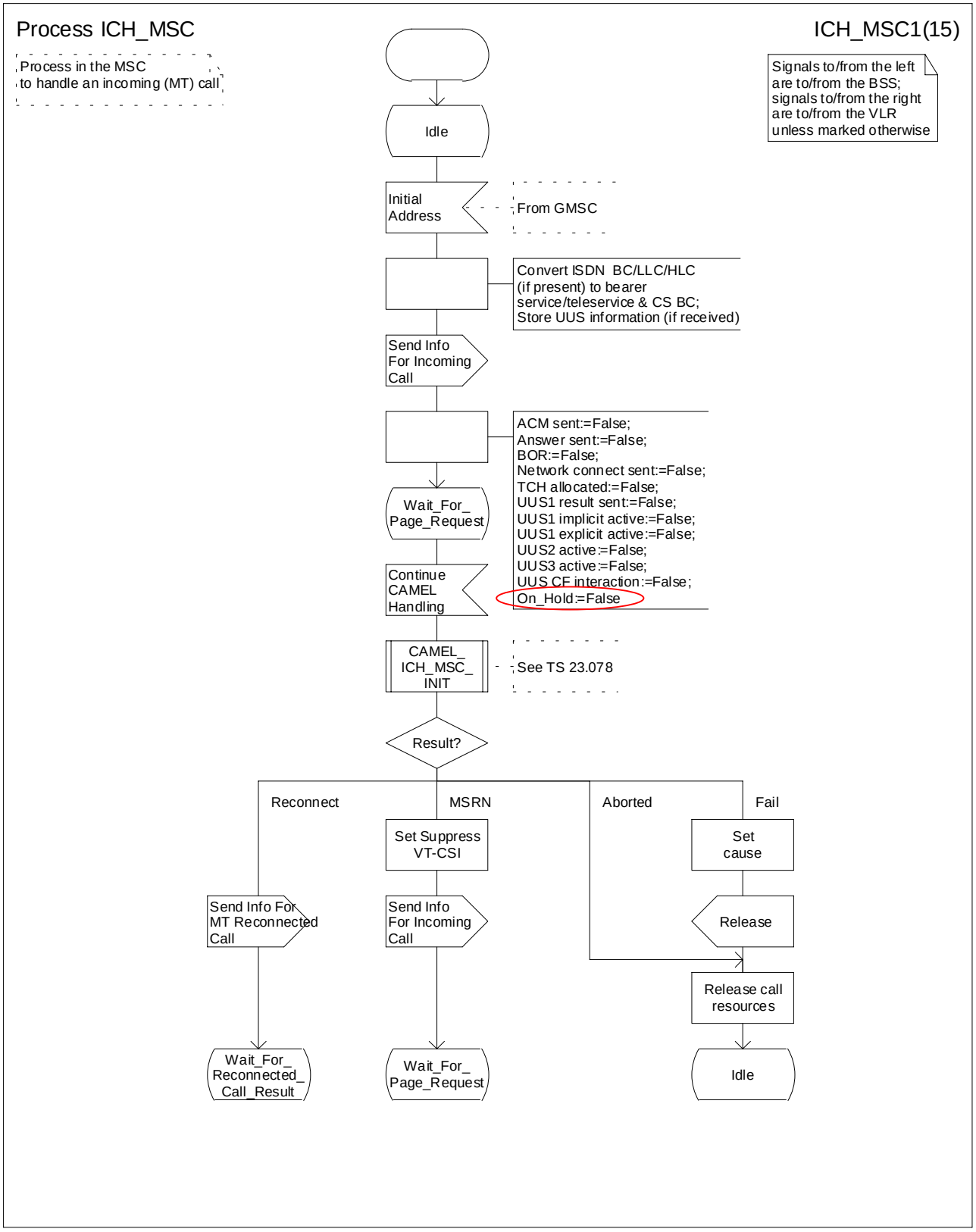
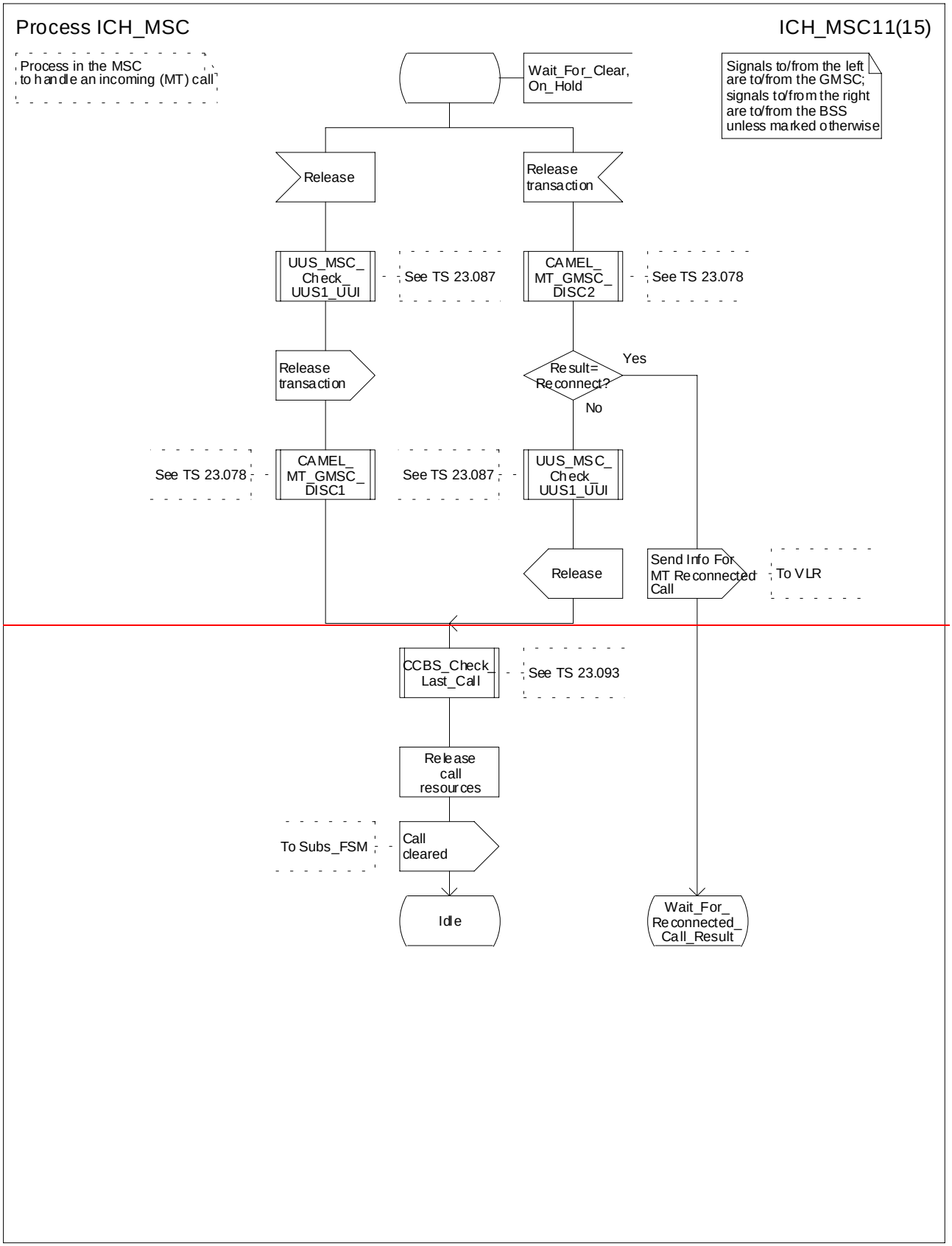


Figure 2a: Process ICH_MSC (sheet 1)


Process ICH_MSC
ICH_MSC11(15)
Process in the MSC to handle an incoming (MT) call
Wait_For_Clear, On_Hold
Signals to/from the left are to/from the GMSC; signals to/from the right are to/from the BSS unless marked otherwise
Release
Release transaction
UUS_MSC_ Check_ UUS1_UUI
See TS 23.087
CAMEL_ MT_GMSC_ DISC2
See TS 23.078
Release transaction
Result= Reconnect?
Yes
No
See TS 23.078
CAMEL_ MT_GMSC_ DISC1
See TS 23.087
UUS_MSC_ Check_ UUS1_UUI
Release
Send Info For MT Reconnected Call
To VLR
CCBS_Check_ Last_Call
See TS 23.093
Release call resources
To Subs_FSM
Call cleared
Idle
Wait_For_ Reconnected_ Call_Result

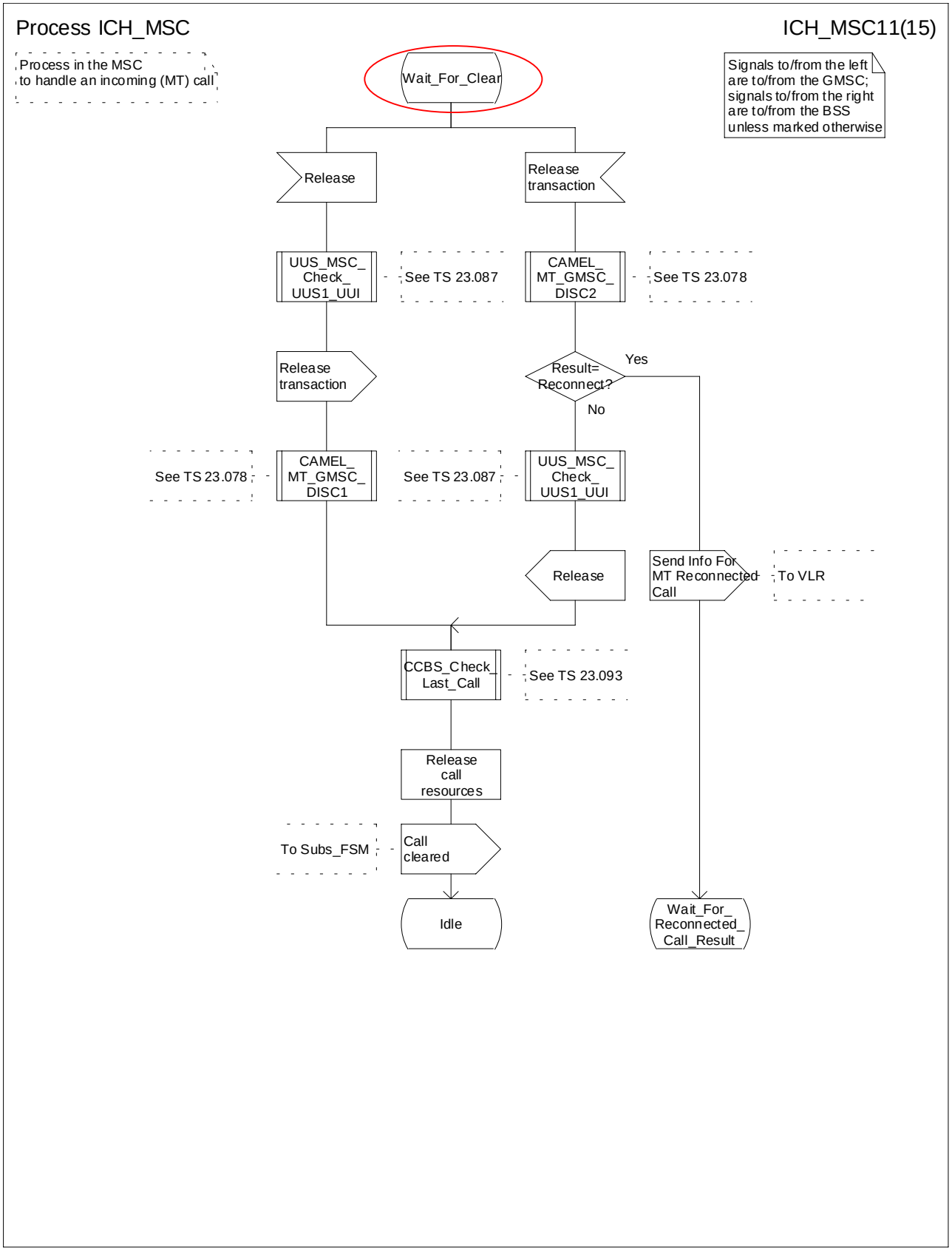
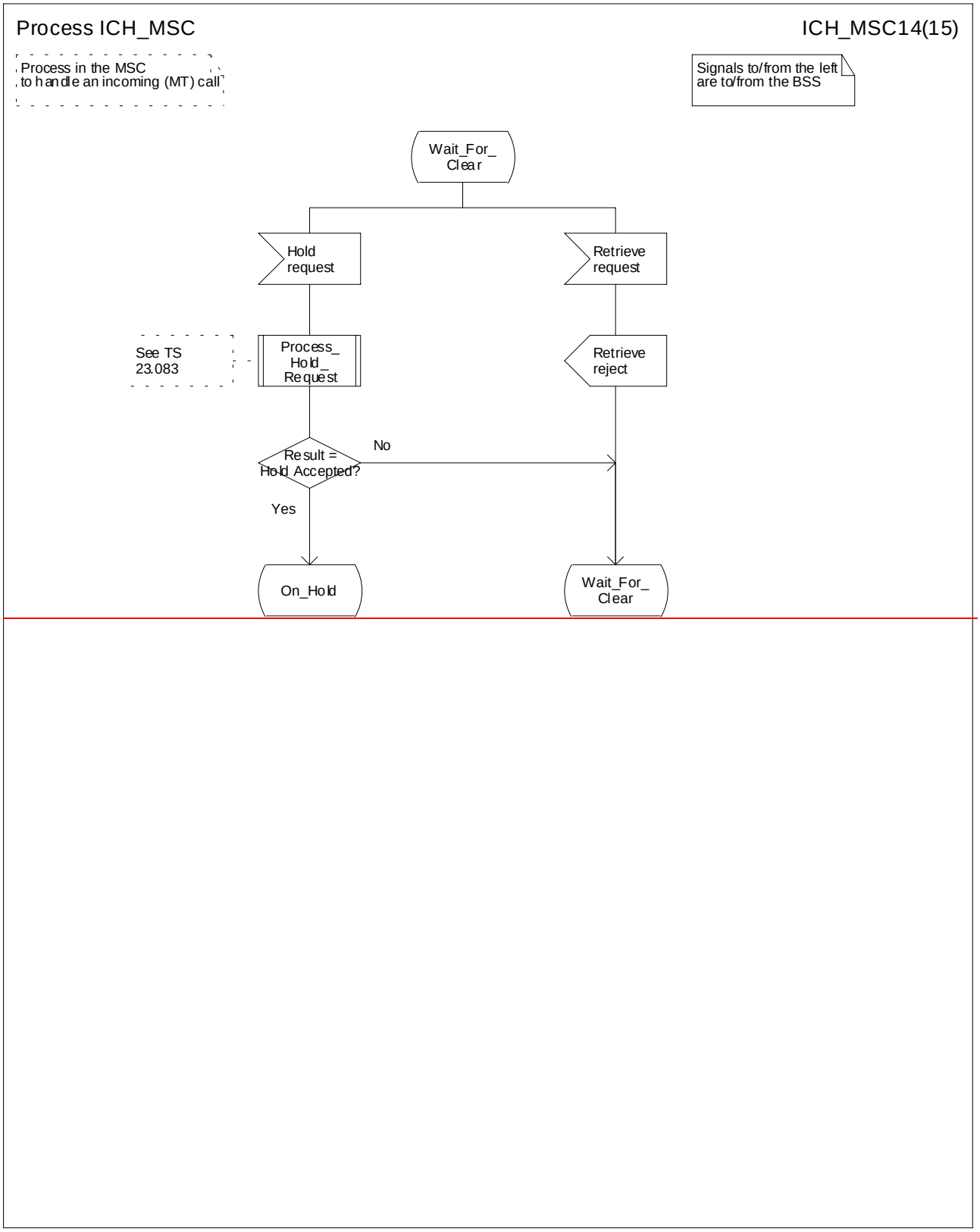


Figure 67k: Process ICH_MSC (sheet 11)

. . .


Process ICH_MSC
ICH_MSC14(15)
Process in the MSC
to handle an incoming (MT) call
Signals to/from the left
are to/from the BSS
Wait_For_
Clear
Hold
request
Retrieve
request
See TS
23.083
Process_
Hold_
Request
Retrieve
reject
Result =
Hold Accepted?
No
Yes
On_Hold
Wait_For_
Clear

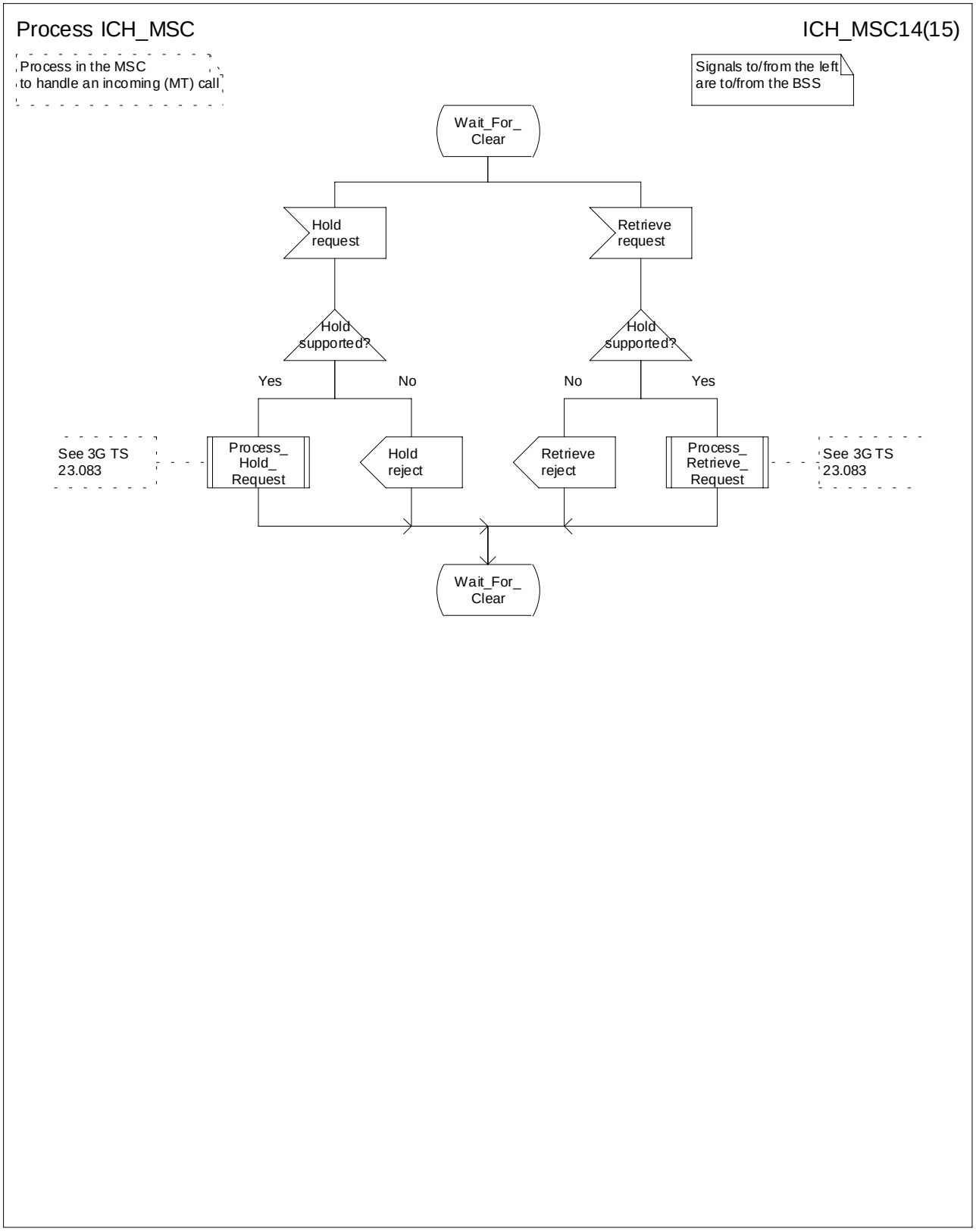
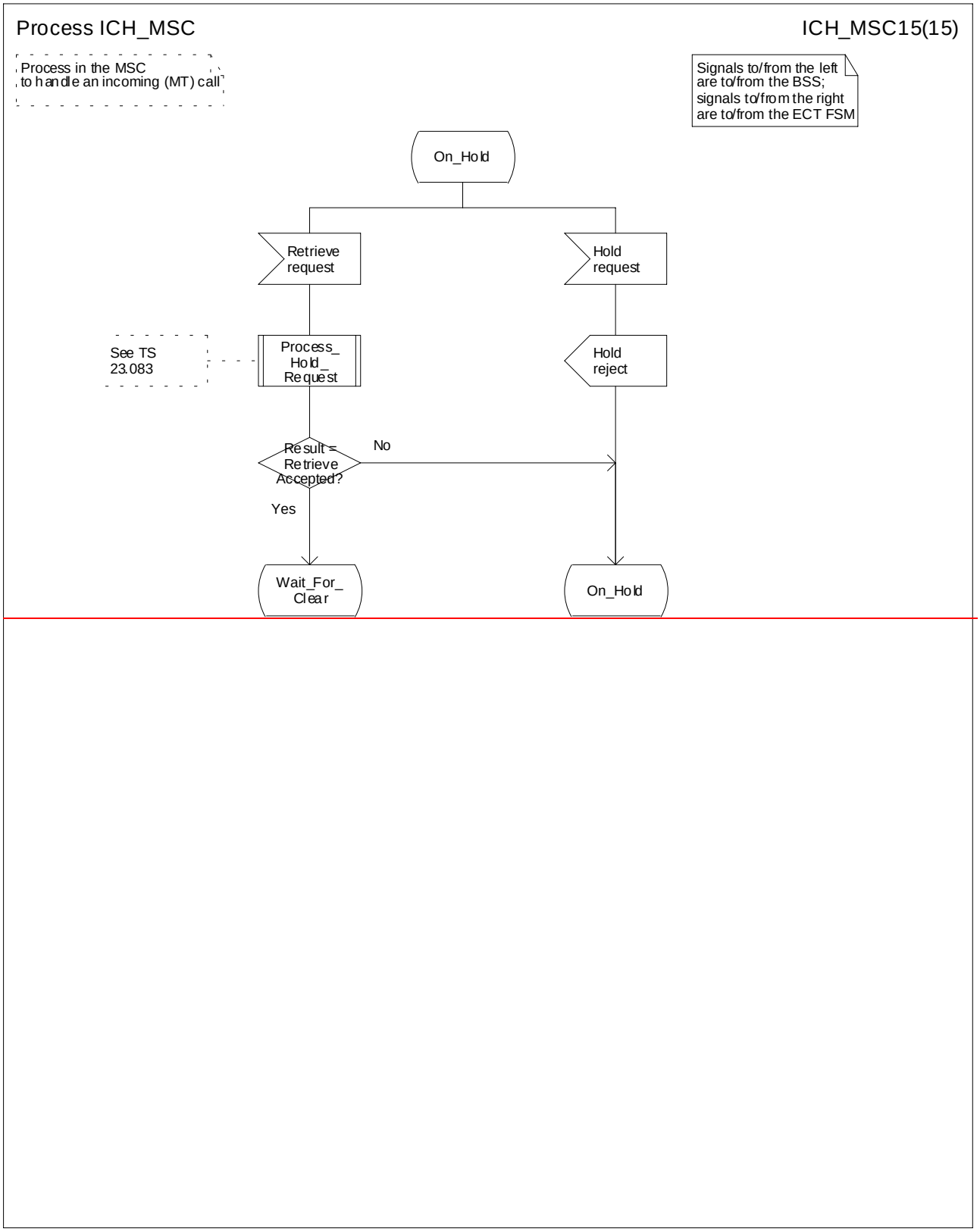


Figure 67n: Process ICH_MSC (sheet 14)


Process ICH_MSC
ICH_MSC15(15)
Process in the MSC
to handle an incoming (MT) call
Signals to/from the left
are to/from the BSS;
signals to/from the right
are to/from the ECT FSM
On_Hold
Retrieve
request
Hold
request
See TS
23.083
Process_
Hold_
Request
Hold
reject
Result =
Retrieve
Accepted?
No
Yes
Wait_For_
Clear
On_Hold

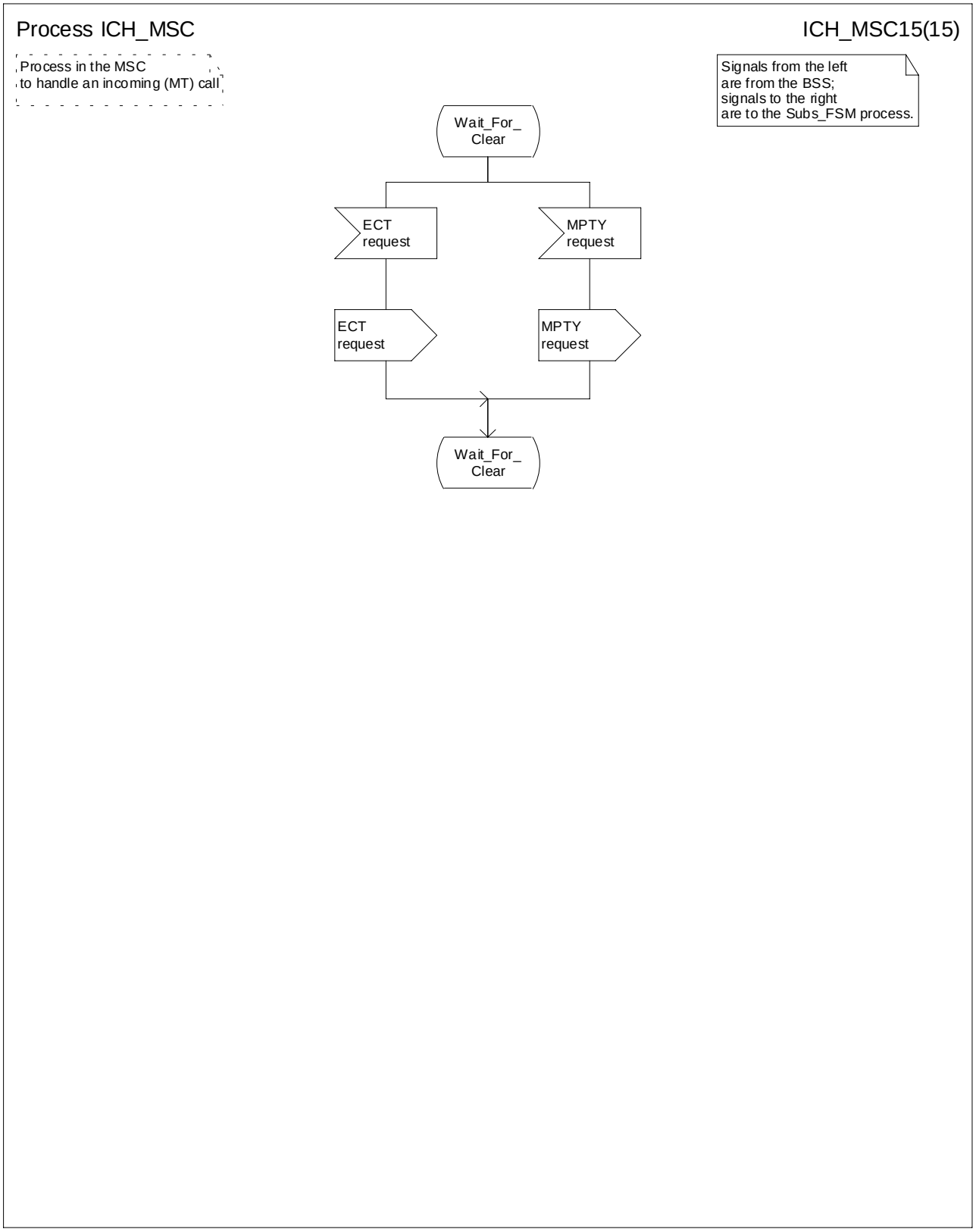
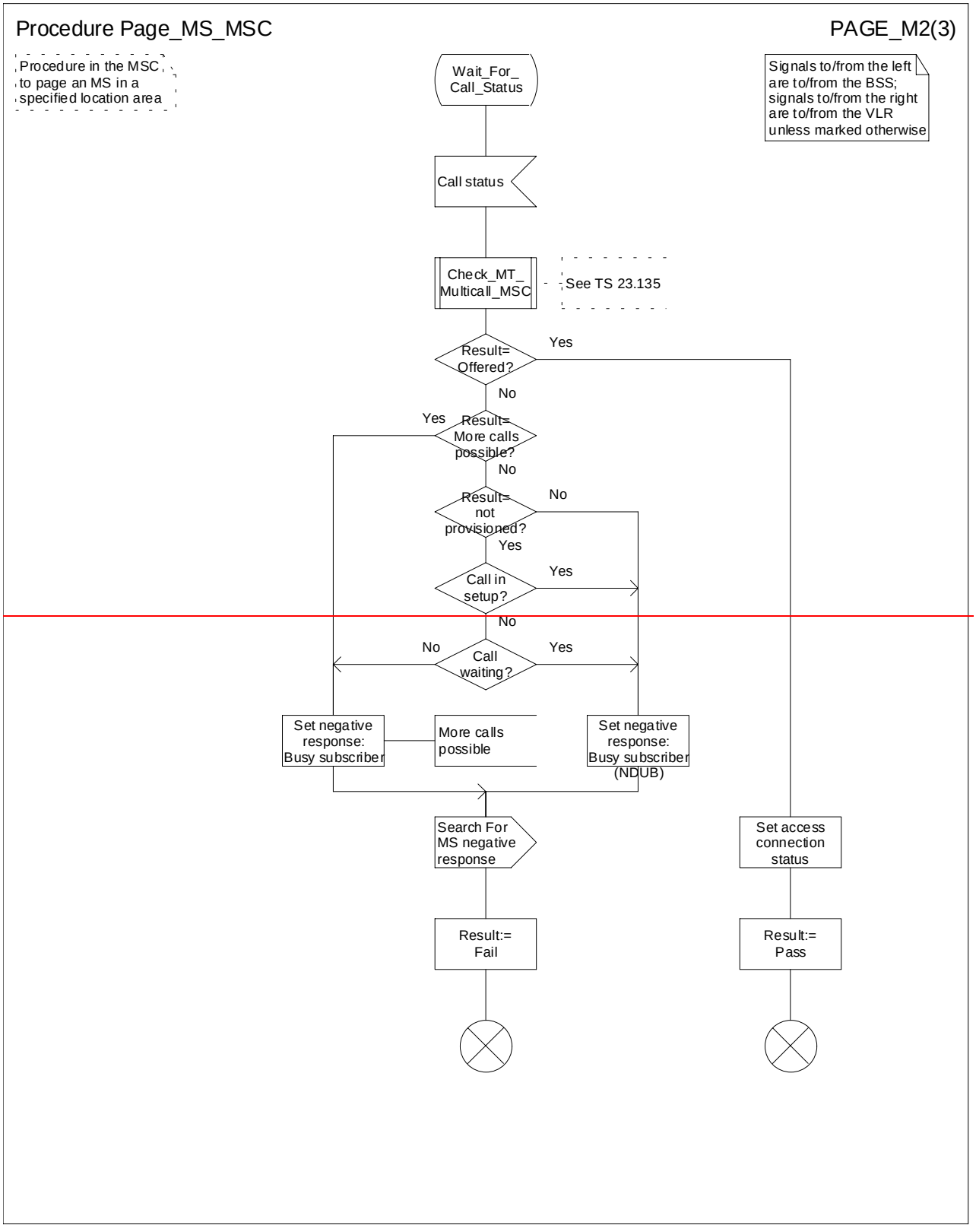


Figure 67o: Process ICH_MSC (sheet 15)

. . .


Procedure Page_MS_MSC
PAGE_M2(3)
Procedure in the MSC to page an MS in a specified location area
Signals to/from the left are to/from the BSS; signals to/from the right are to/from the VLR unless marked otherwise
Wait_For_ Call_Status
Call status
Check_MT_ Multicall_MSC
See TS 23.135
Result= Offered?
Yes
No
Result= More calls possible?
Yes
No
Result= not provisioned?
No
Yes
Call in setup?
Yes
No
Call waiting?
No
Yes
Set negative response: Busy subscriber
More calls possible
Set negative response: Busy subscriber (NDUB)
Search For MS negative response
Set access connection status
Result:= Fail
Result:= Pass

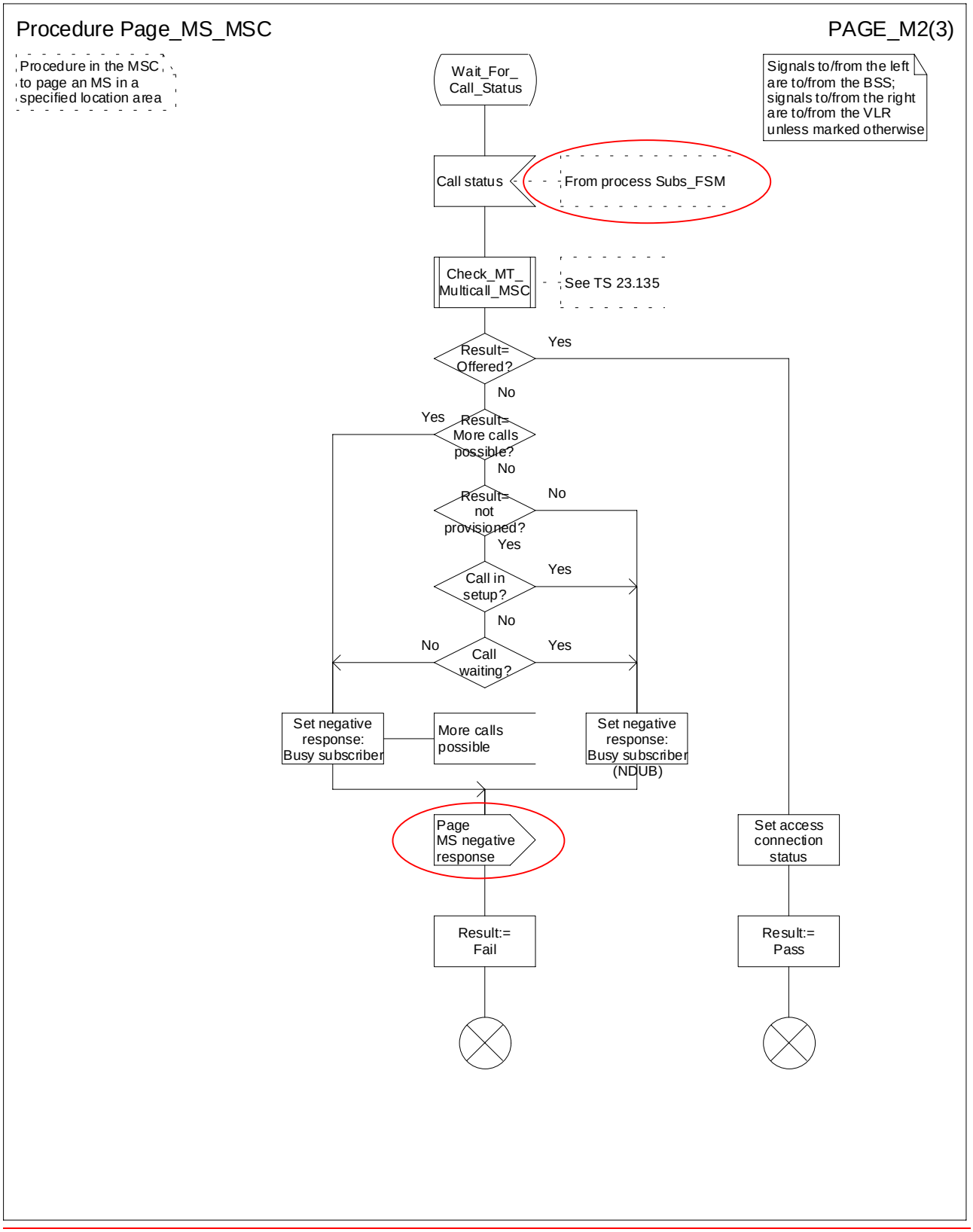
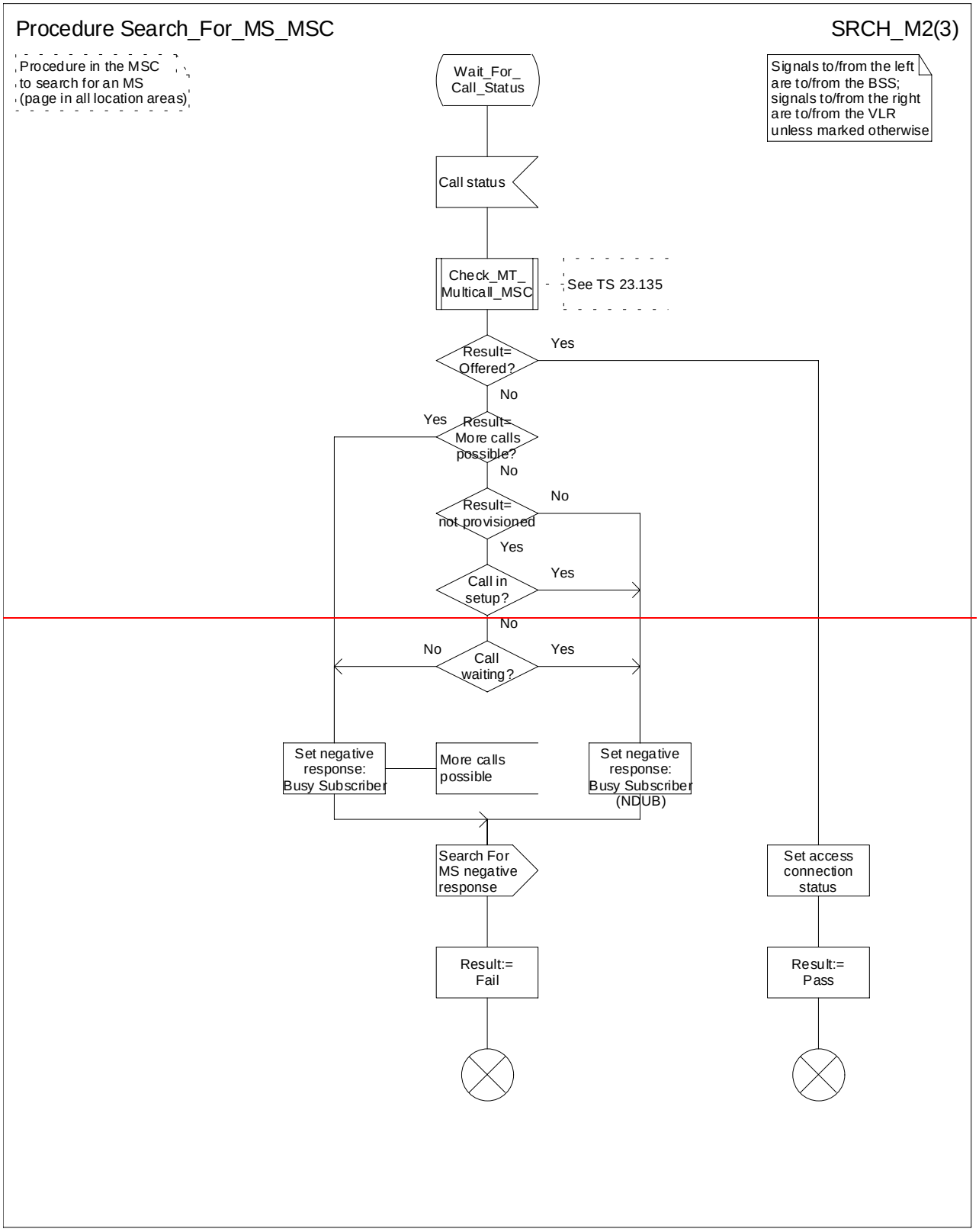


Figure 68b: Procedure Page_MS_MSC (sheet 2)

. . .


Procedure Search_For_MS_MSC
SRCH_M2(3)
Procedure in the MSC to search for an MS (page in all location areas)
Wait_For_ Call_Status
Signals to/from the left are to/from the BSS; signals to/from the right are to/from the VLR unless marked otherwise
Call status
Check_MT_ Multicall_MSC
See TS 23.135
Result= Offered?
Yes
No
Result= More calls possible?
Yes
No
Result= not provisioned
No
Yes
Call in setup?
Yes
No
Call waiting?
No
Yes
Set negative response: Busy Subscriber
More calls possible
Set negative response: Busy Subscriber (NDUB)
Search For MS negative response
Set access connection status
Result:= Fail
Result:= Pass

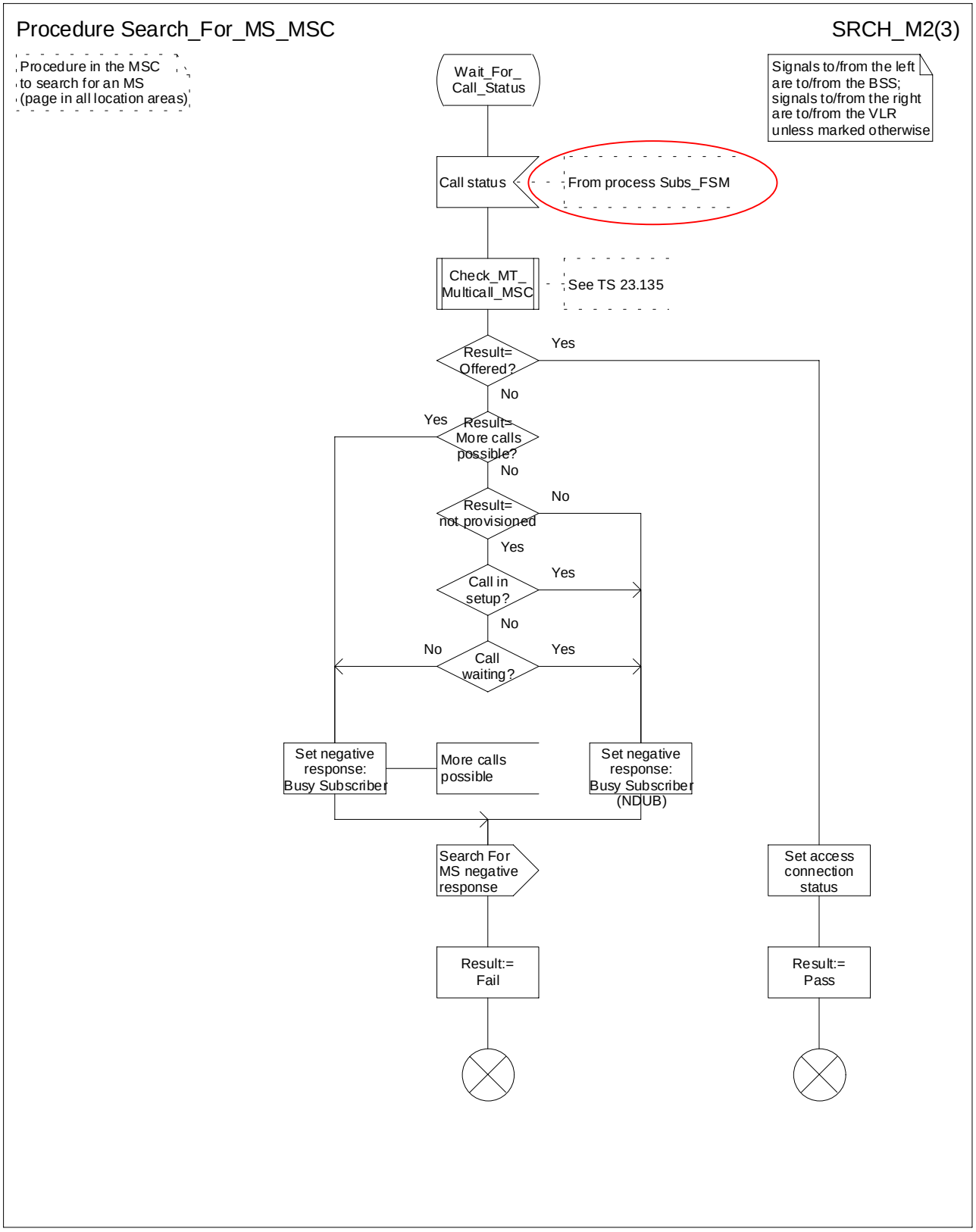


Figure 69b: Procedure Search_For_MS_MSC (sheet 2)

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

7.4 Subs_FSM

7.4.1 Functional requirements of serving MSC

7.4.1.1 Process Subs_FSM

One instance of the process Subs_FSM runs for each subscriber who is involved in at least one call. It monitors the state of any ongoing calls for that subscriber. The individual call control processes OCH_MSC and ICH_MSC submit supplementary service requests received from the MS to the process Subs_FSM, which then responds appropriately.

The process Subs_FSM interacts with the processes OCH_MSC and ICH_MSC as specified in subclauses 7.1.1 and 7.3.1.

Sheet 5, sheet 6, sheet 7, sheet 8, sheet 9, sheet 11, sheet 12, sheet 15: processing on this page will occur only if the VMSC supports HOLD.

Sheet 8: the procdure Handle_MPTY is specific to MPTY; it is specified in TS 23.084 [17].

Sheet 8: the procedure Handle_ECT_Active is specific to ECT; it is specified in TS 23.091 [22].

Sheet 10: processing on this page will occur only if the VMSC supports Multicall.

Sheet 12: the procedure Handle_ECT_Alerting is specific to ECT; it is specified in TS 23.091 [22].

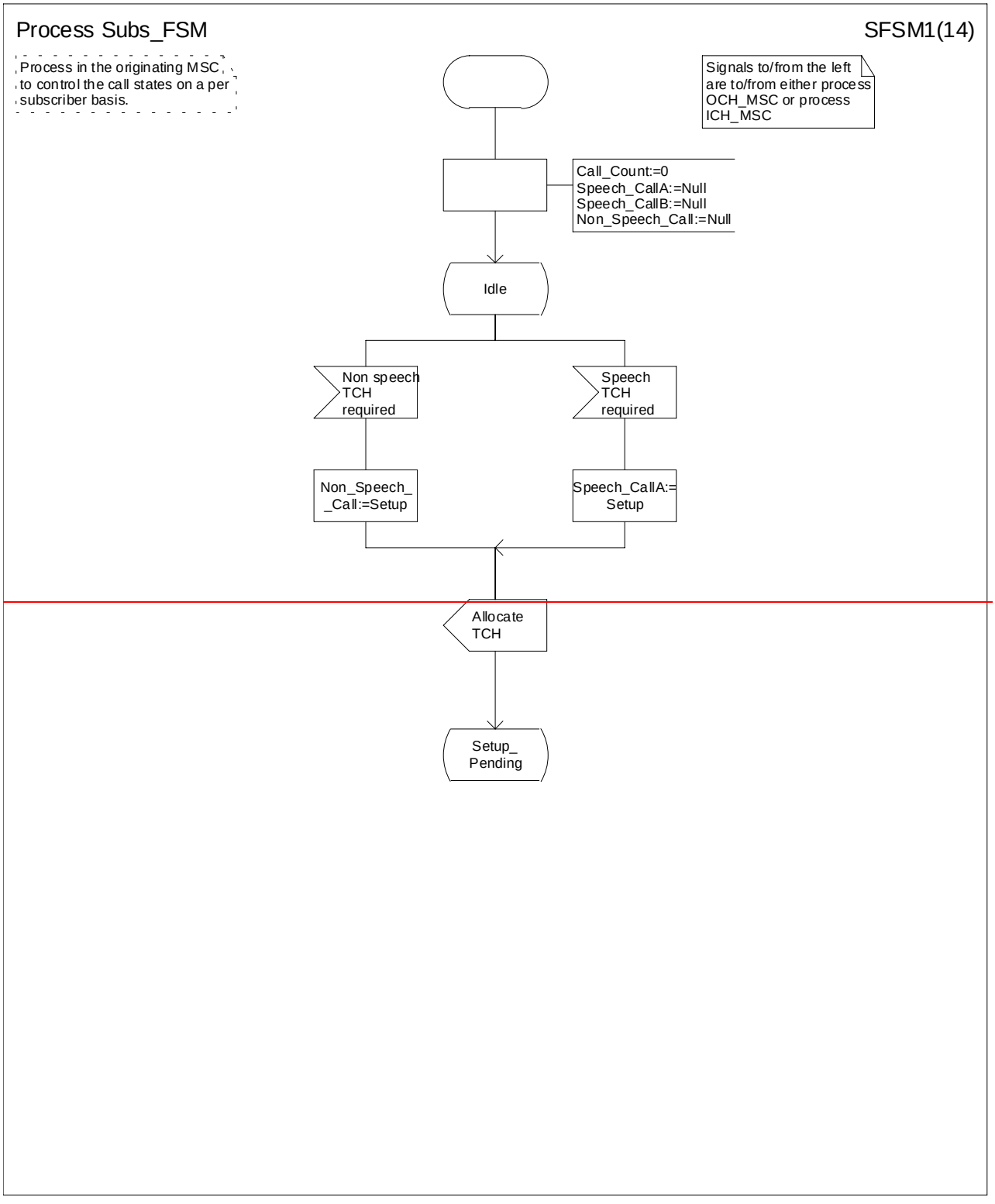
Sheet 13, sheet 14: processing on this page will occur only if the VMSC supports both HOLD and Multicall.

7.4.1.1.1 Macro Check_Ongoing_Calls

7.4.1.1.2 Update_Non_Speech_Calls_Status

7.4.1.1.1 Increment_Call_Counter

7.4.1.1.1 Decrement_Call_Counter


Process Subs_FSM
SFSM1(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Count:=0
Speech_CallA:=Null
Speech_CallB:=Null
Non_Speech_Call:=Null
Idle
Non speech TCH required
Speech TCH required
Non_Speech_ _Call:=Setup
Speech_CallA:= Setup
Allocate TCH
Setup_ Pending

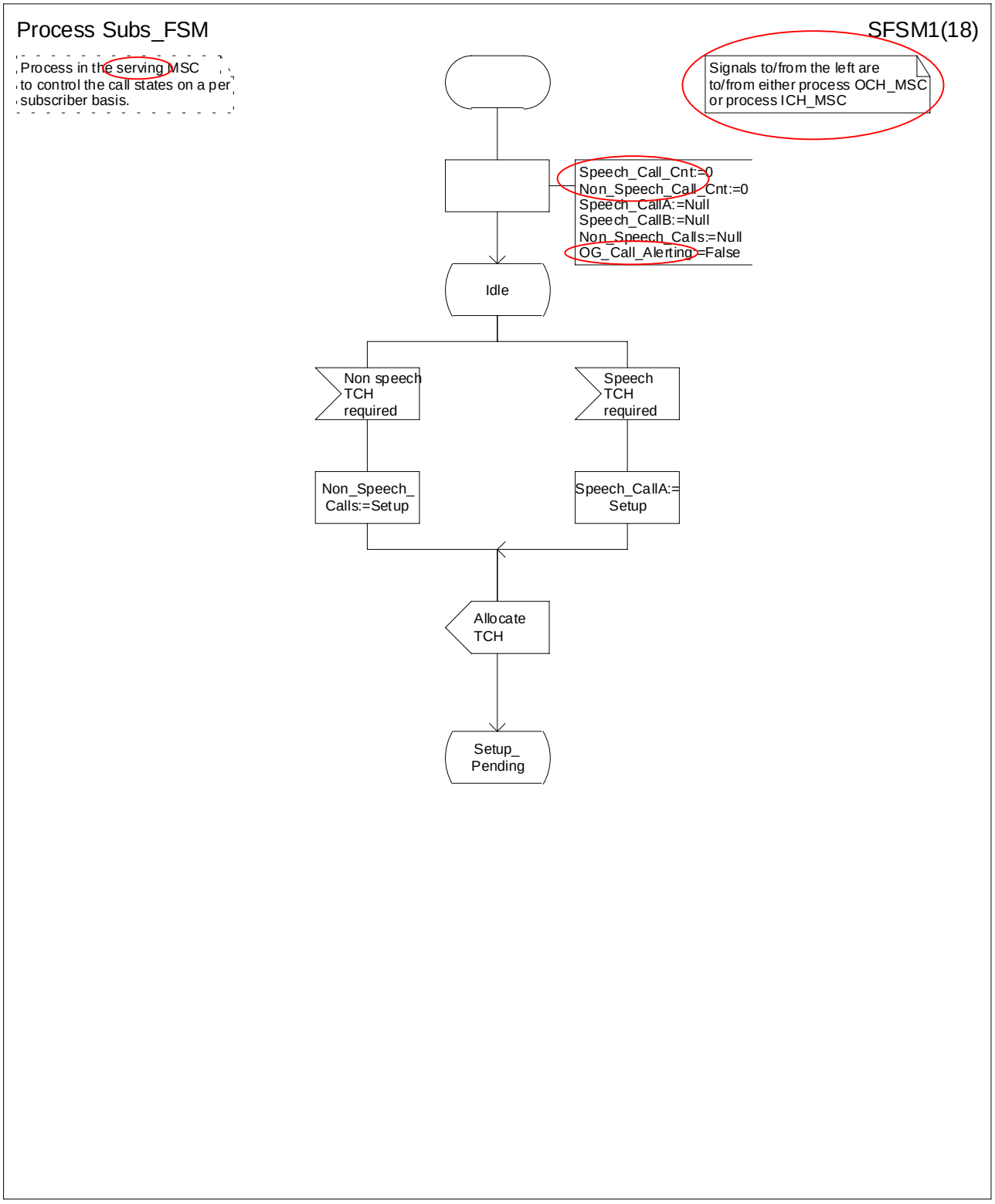
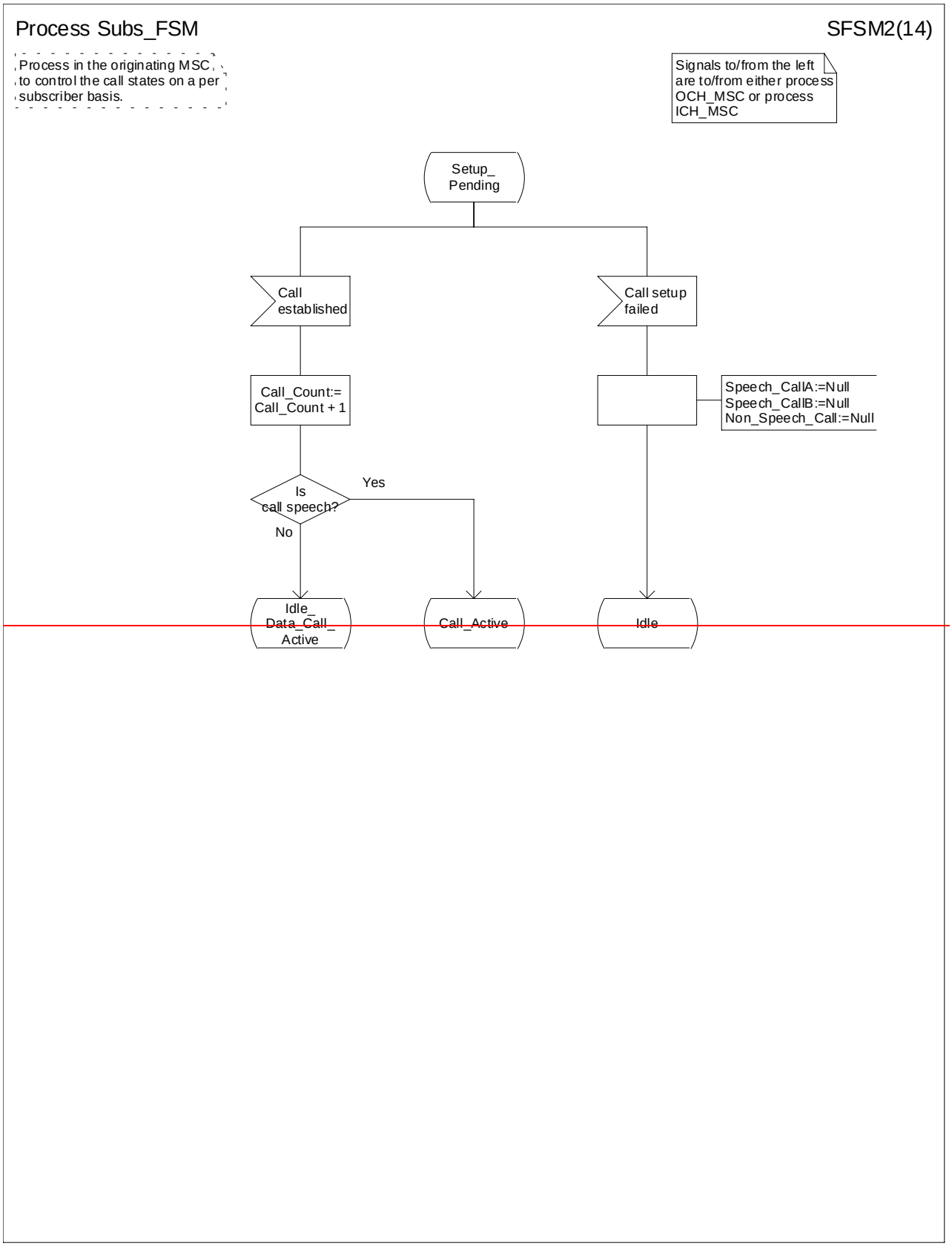


Figure 84a: Process Subs_FSM (sheet 1)


Process Subs_FSM
SFSM2(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Setup_ Pending
Call established
Call setup failed
Call_Count:= Call_Count + 1
Speech_CallA:=Null
Speech_CallB:=Null
Non_Speech_Call:=Null
Is call speech?
Yes
No
Idle_ Data_Call_ Active
Call_Active
Idle

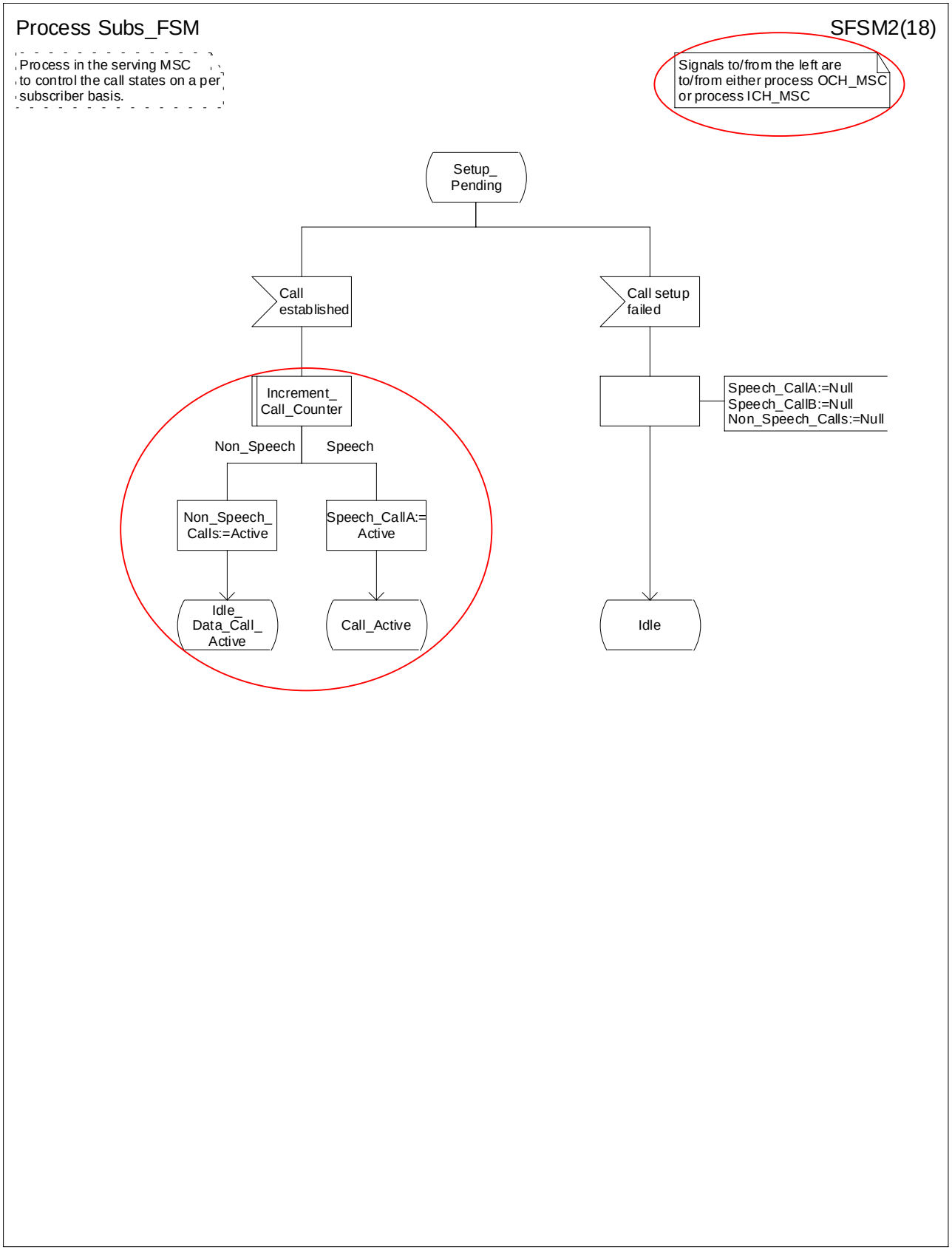
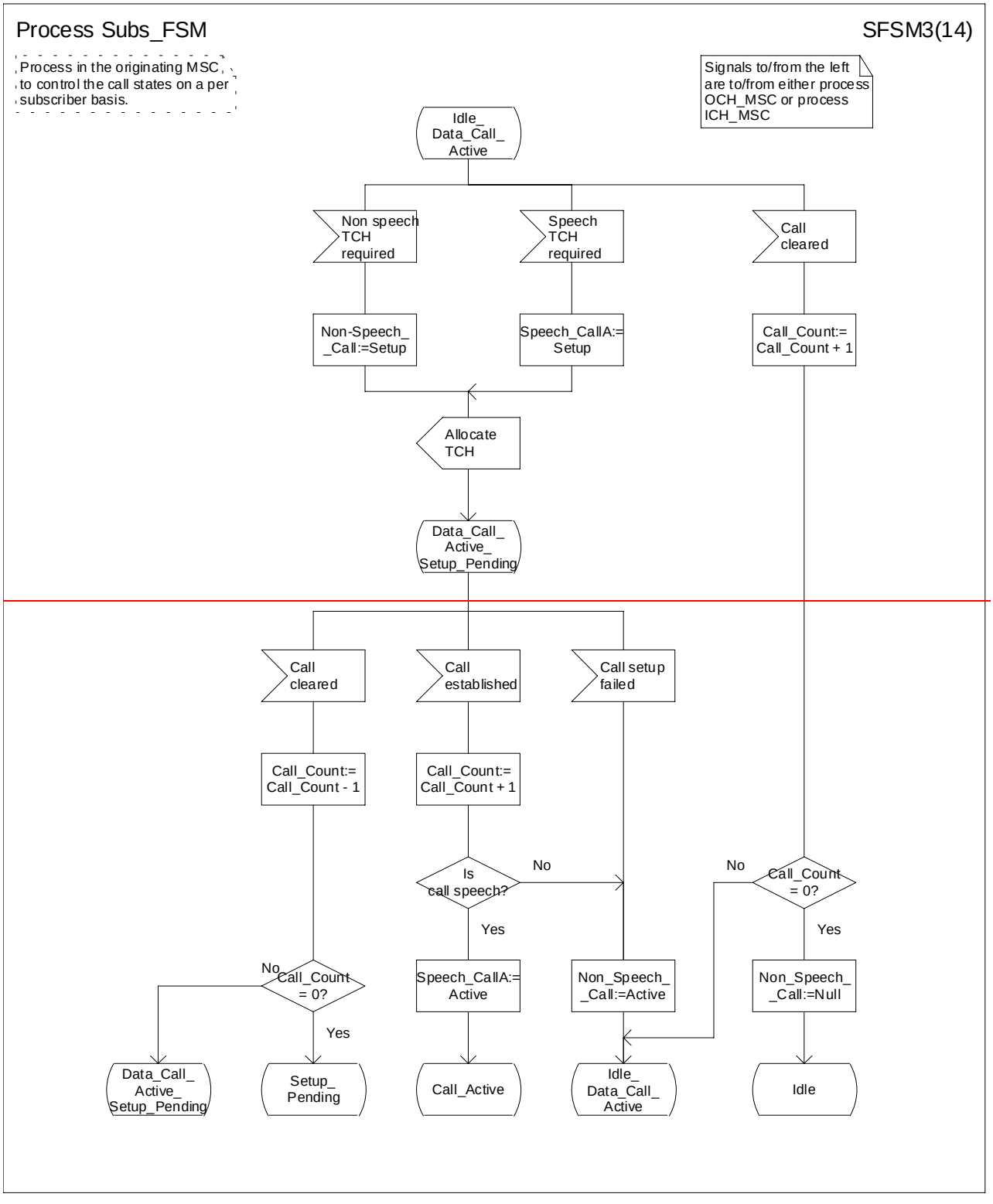


Figure 84b: Process Subs_FSM (sheet 2)


Process Subs_FSM
SFSM3(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Idle_ Data_Call_ Active
Non speech TCH required
Speech TCH required
Call cleared
Non-Speech_ _Call:=Setup
Speech_CallA:= Setup
Call_Count:= Call_Count + 1
Allocate TCH
Data_Call_ Active_ Setup_Pending
Call cleared
Call established
Call setup failed
Call_Count:= Call_Count - 1
Call_Count:= Call_Count + 1
Is call speech?
No
Yes
No
Call_Count = 0?
Yes
No
Call_Count = 0?
Yes
Speech_CallA:= Active
Non_Speech_ _Call:=Active
Non_Speech_ _Call:=Null
Data_Call_ Active_ Setup_Pending
Setup_ Pending
Call_Active
Idle_ Data_Call_ Active
Idle

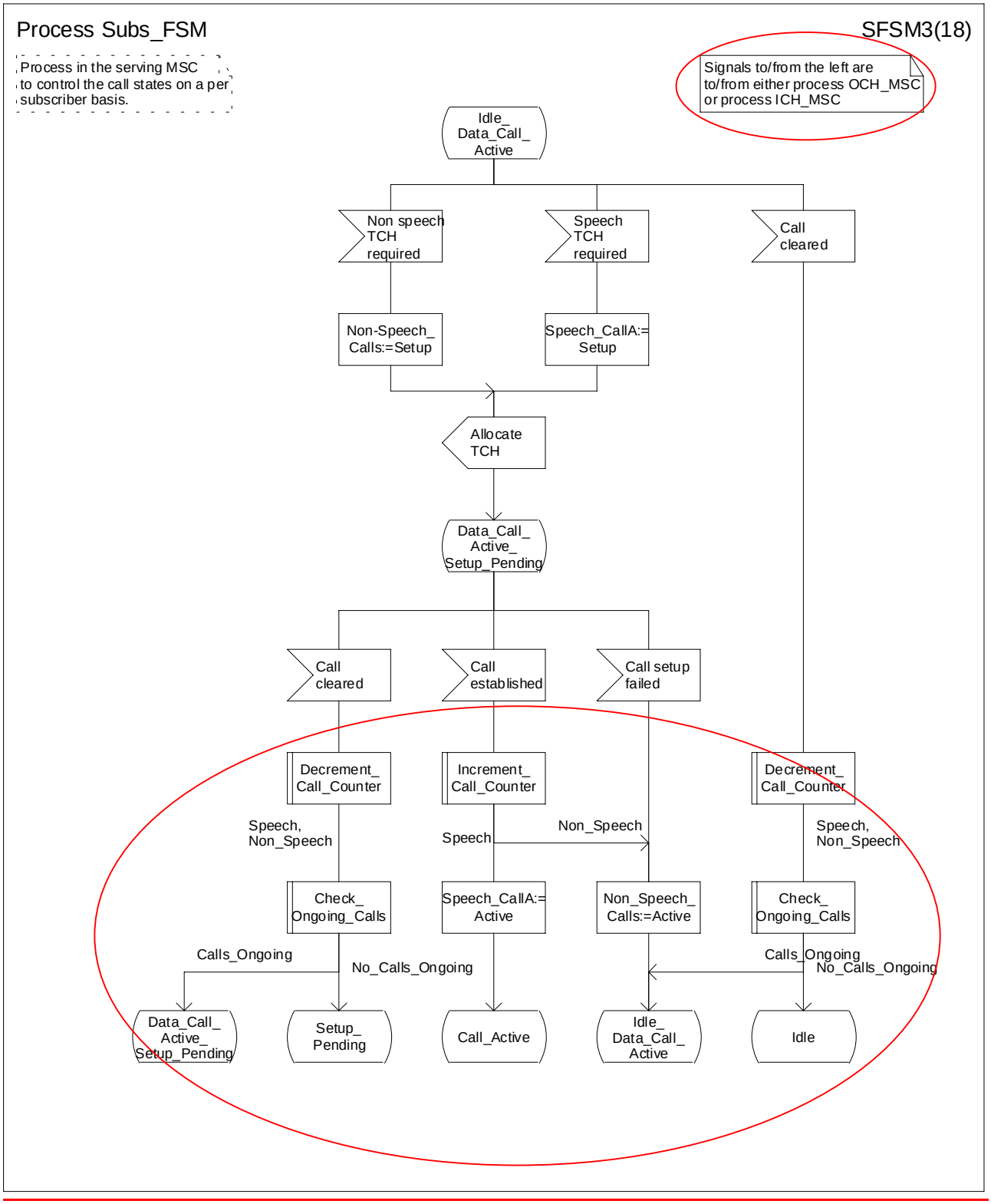
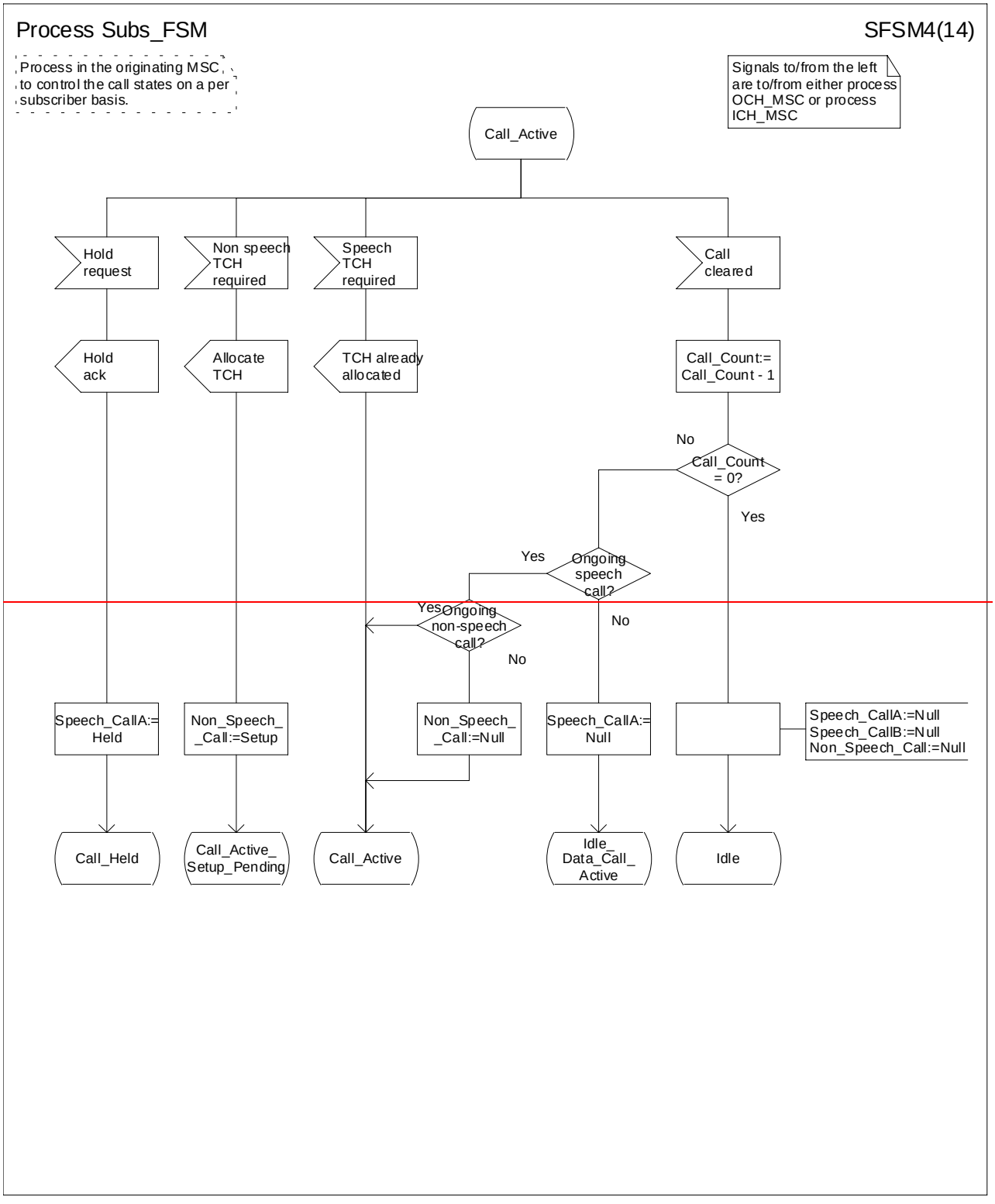


Figure 84c: Process Subs_FSM (sheet 3)


Process Subs_FSM
SFSM4(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Active
Hold request
Non speech TCH required
Speech TCH required
Call cleared
Hold ack
Allocate TCH
TCH already allocated
Call_Count:= Call_Count - 1
No
Call_Count = 0?
Yes
Yes
Ongoing speech call?
Yes
Ongoing non-speech call?
No
No
Speech_CallA:= Held
Non_Speech_ _Call:=Setup
Non_Speech_ _Call:=Null
Speech_CallA:= Null
Speech_CallA:=Null
Speech_CallB:=Null
Non_Speech_Call:=Null
Call_Held
Call_Active_ Setup_Pending
Call_Active
Idle_ Data_Call_ Active
Idle

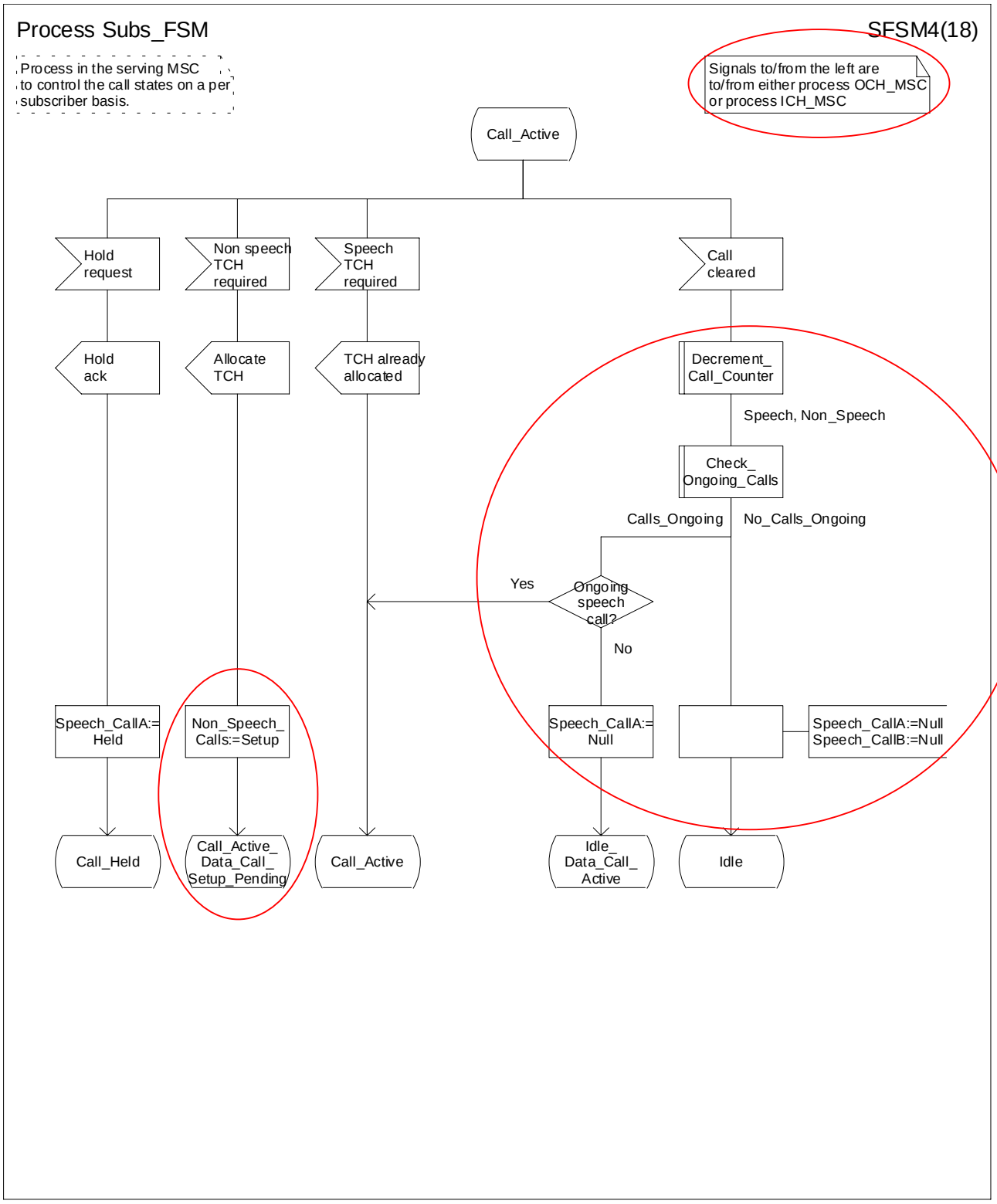
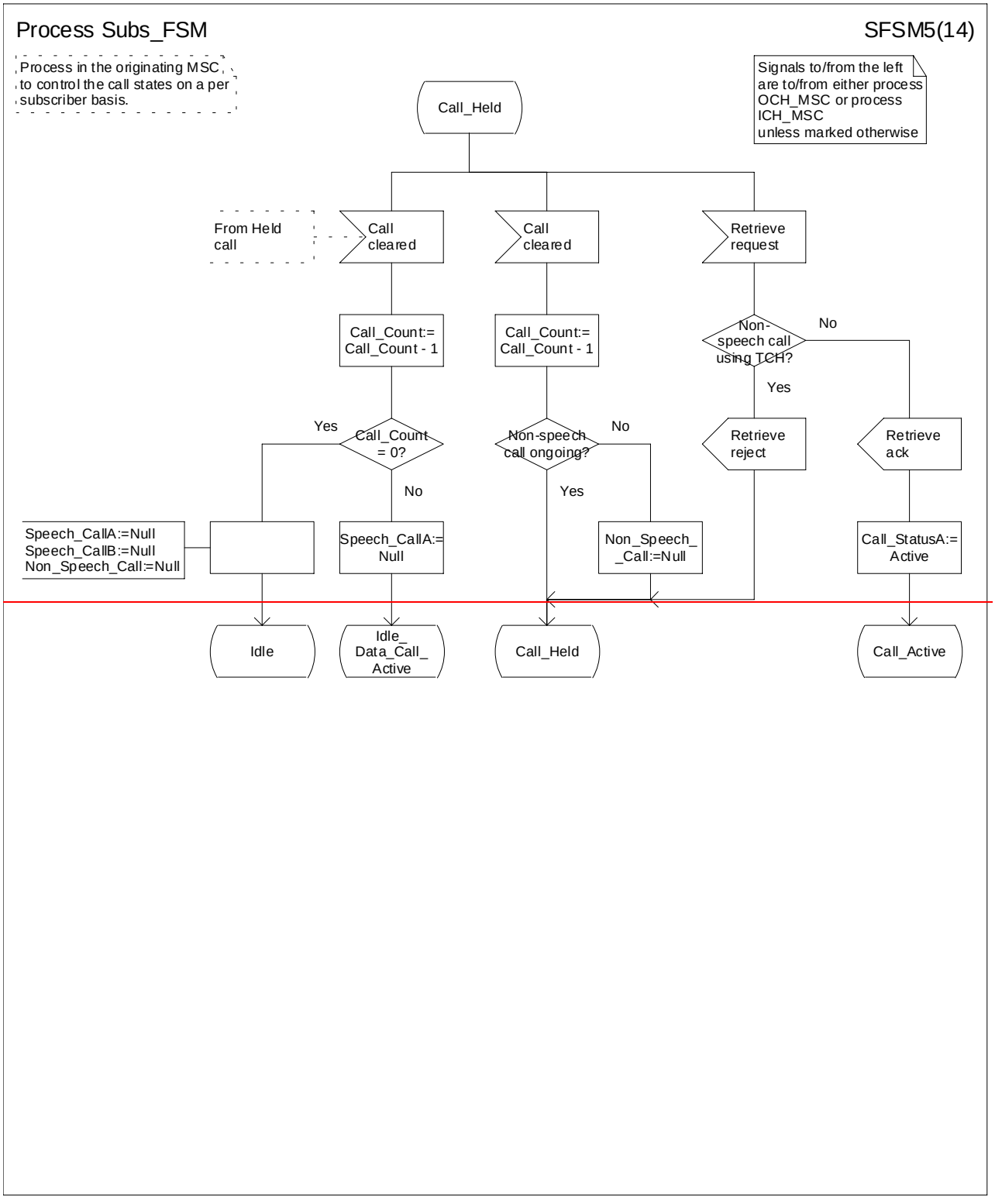


Figure 84d: Process Subs_FSM (sheet 4)


Process Subs_FSM
SFSM5(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC unless marked otherwise
Call_Held
From Held call
Call cleared
Call cleared
Retrieve request
Call_Count:= Call_Count - 1
Call_Count:= Call_Count - 1
Non-speech call using TCH?
No
Yes
Yes
Call_Count = 0?
Non-speech call ongoing?
No
Retrieve reject
Retrieve ack
No
Yes
Speech_CallA:=Null
Speech_CallB:=Null
Non_Speech_Call:=Null
Speech_CallA:= Null
Non_Speech_ _Call:=Null
Call_StatusA:= Active
Idle
Idle_ Data_Call_ Active
Call_Held
Call_Active

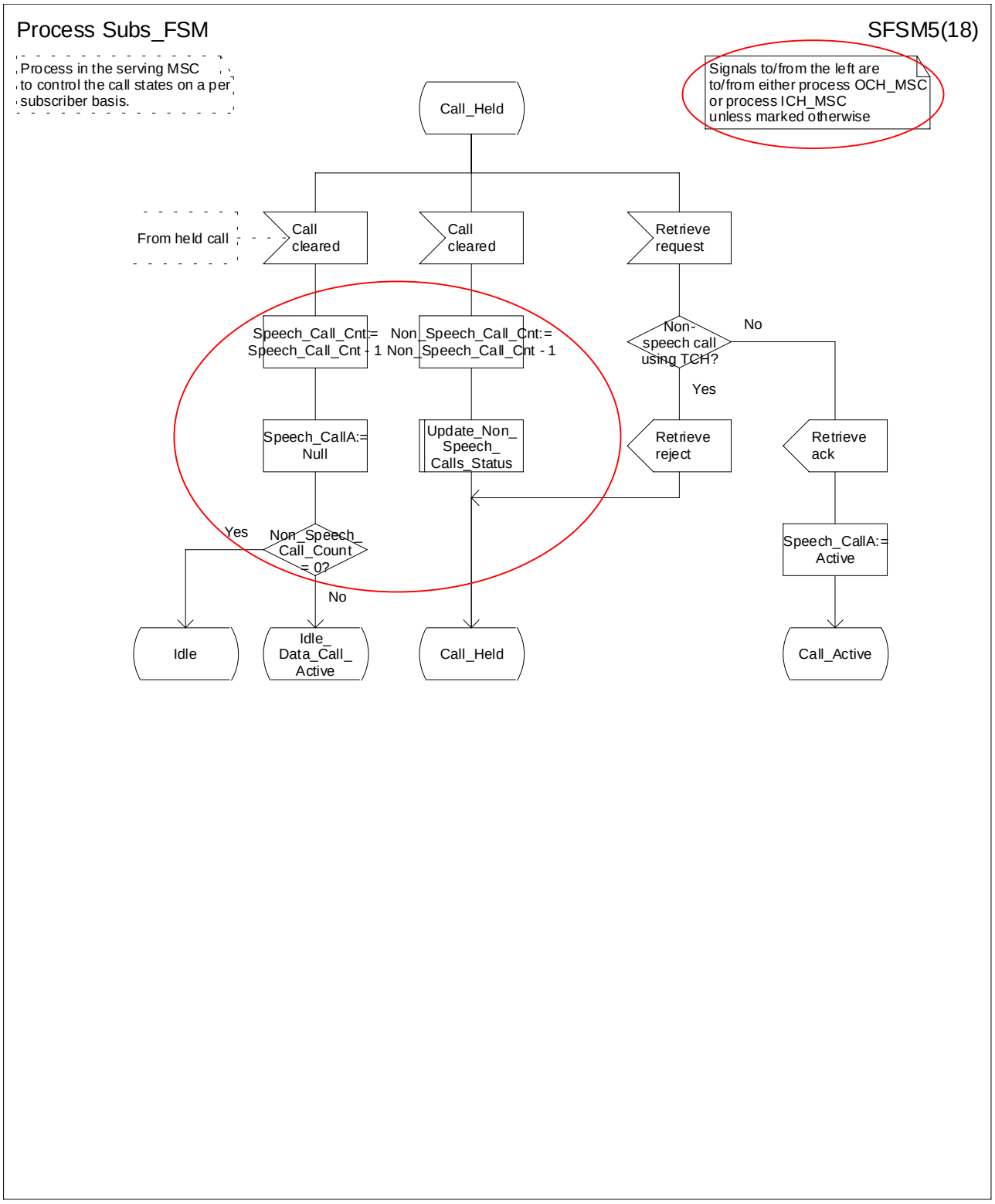
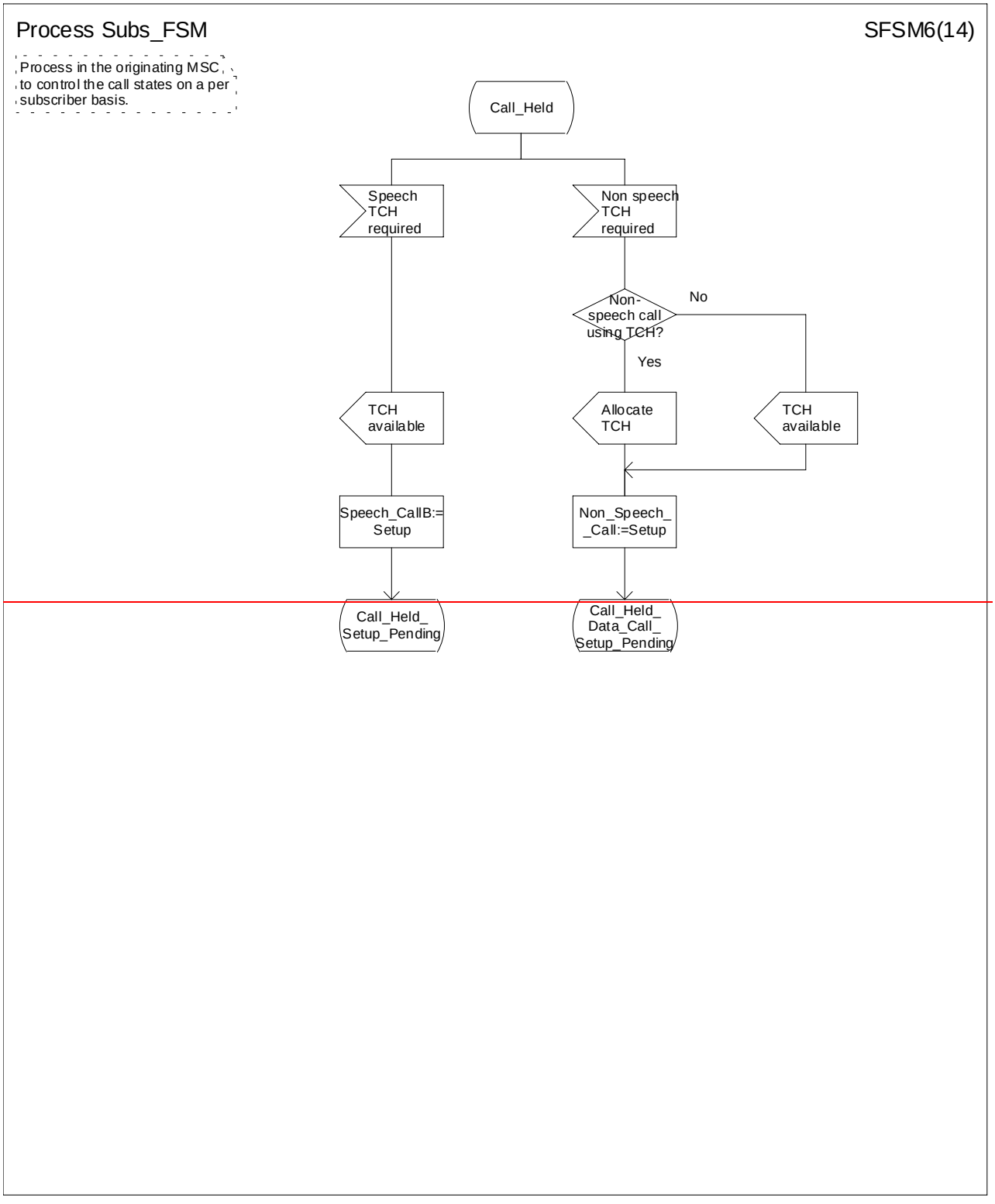


Figure 84e: Process Subs_FSM (sheet 5)


Process Subs_FSM
SFSM6(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Call_Held
Speech TCH required
Non speech TCH required
Non-speech call using TCH?
No
Yes
TCH available
Allocate TCH
TCH available
Speech_CallB:= Setup
Non_Speech_ _Call:=Setup
Call_Held_ Setup_Pending
Call_Held_ Data_Call_ Setup_Pending

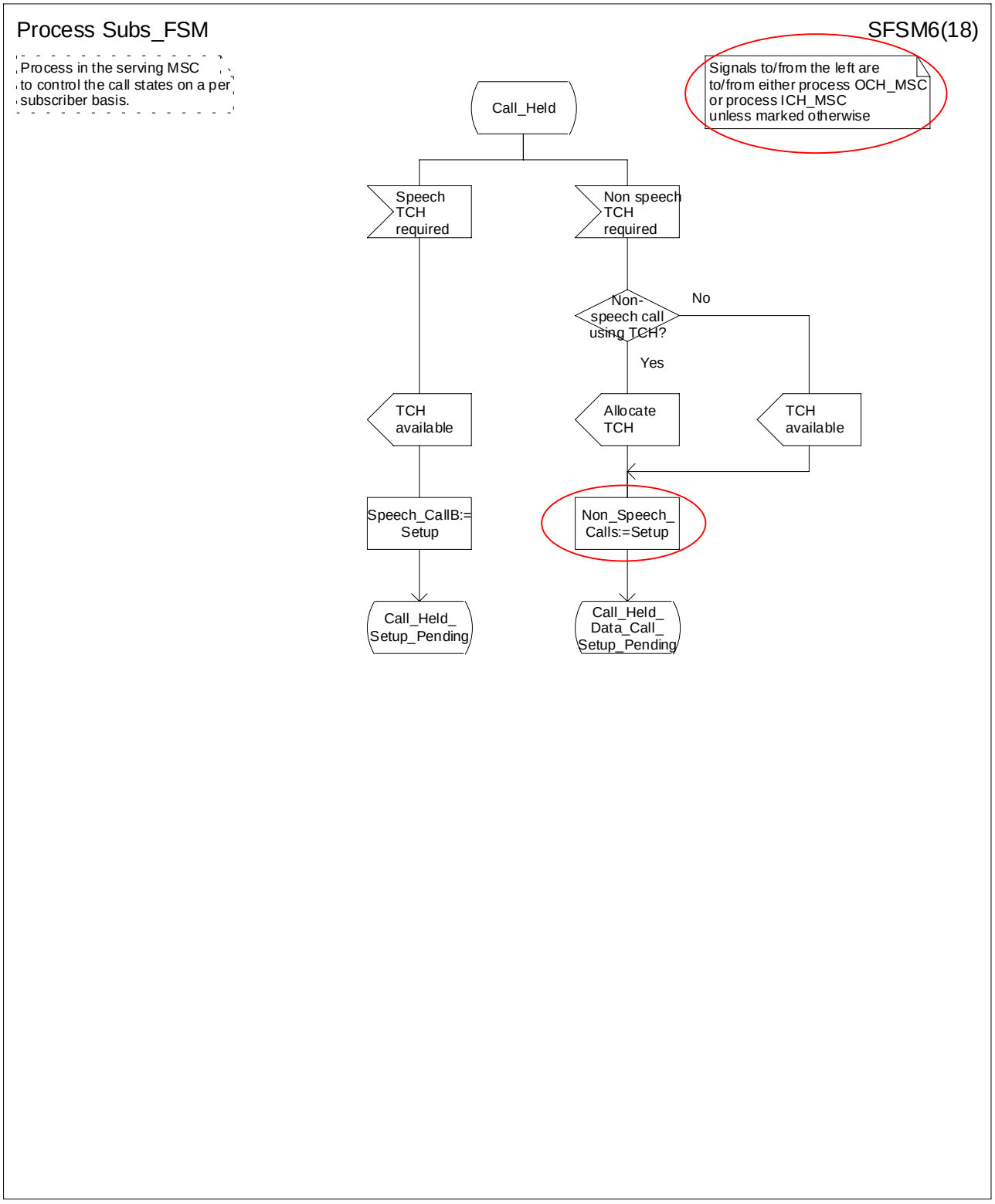
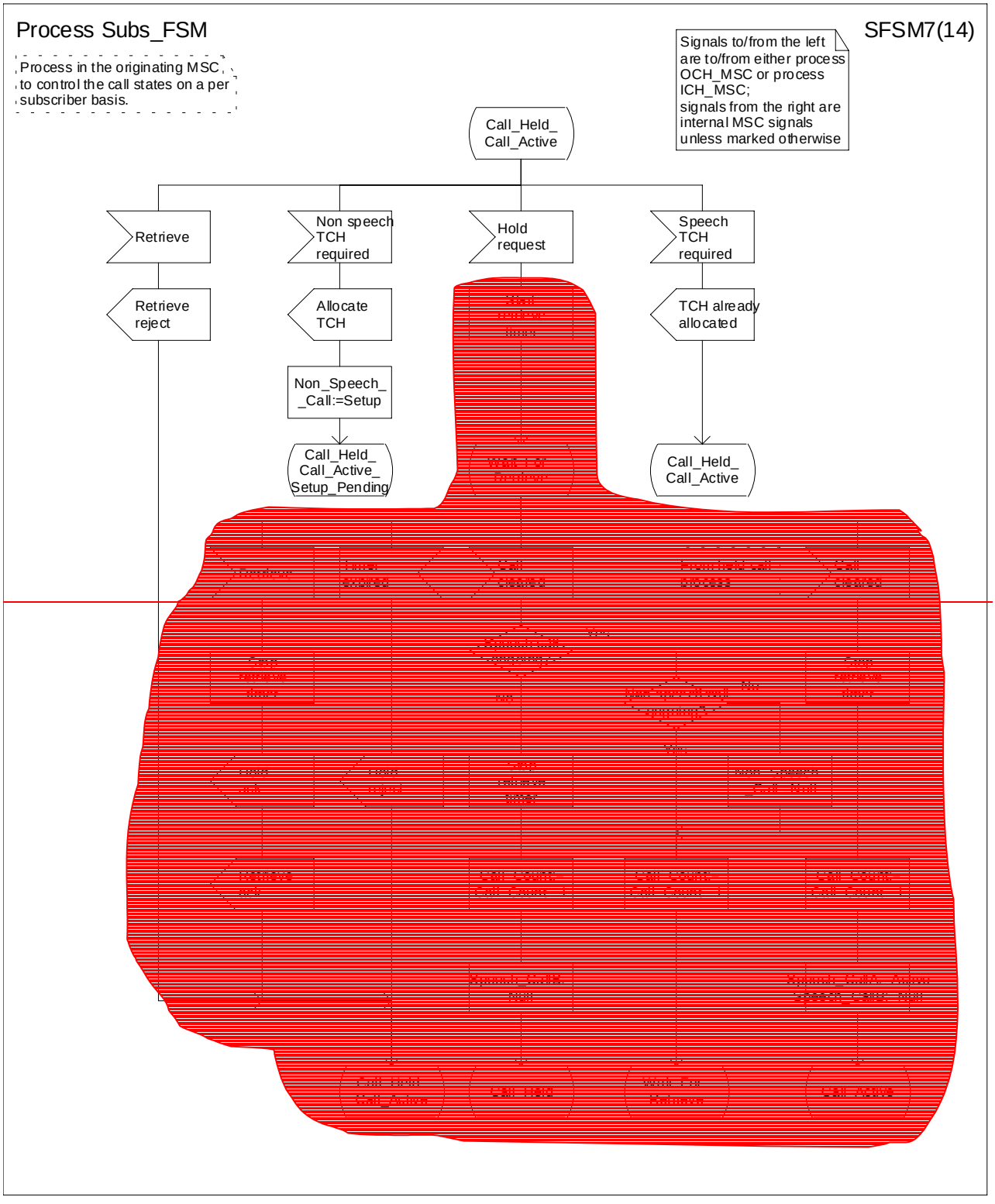


Figure 84f: Process Subs_FSM (sheet 6)


Process Subs_FSM
SFSM7(14)
Process in the originating MSC, to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC;
signals from the right are internal MSC signals unless marked otherwise
Call_Held_ Call_Active
Retrieve
Non speech TCH required
Hold request
Speech TCH required
Retrieve reject
Allocate TCH
TCH already allocated
Non_Speech_ _Call:=Setup
Call_Held_ Call_Active_ Setup_Pending
Call_Held_ Call_Active

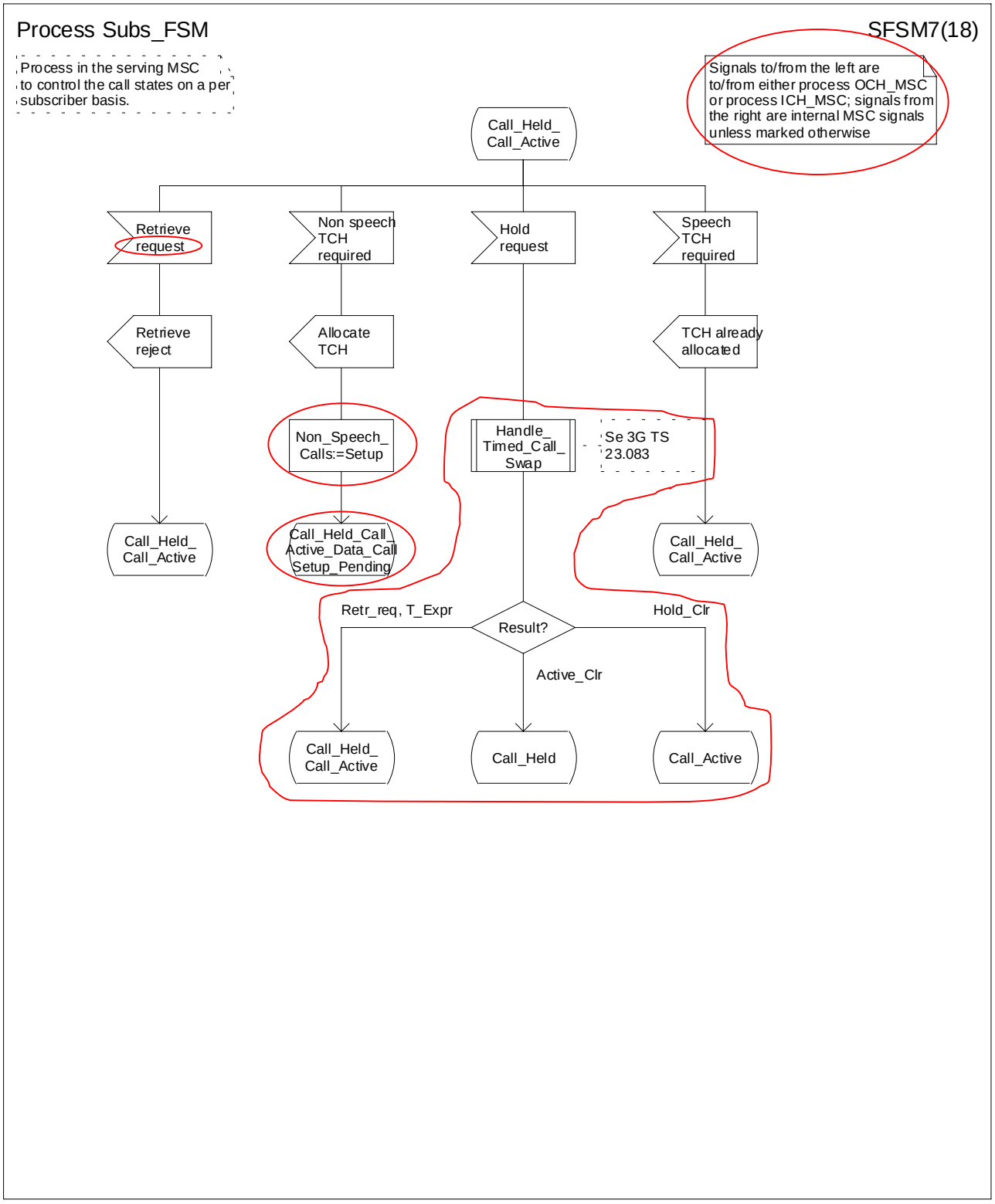


Figure 84g: Process Subs_FSM (sheet 7)

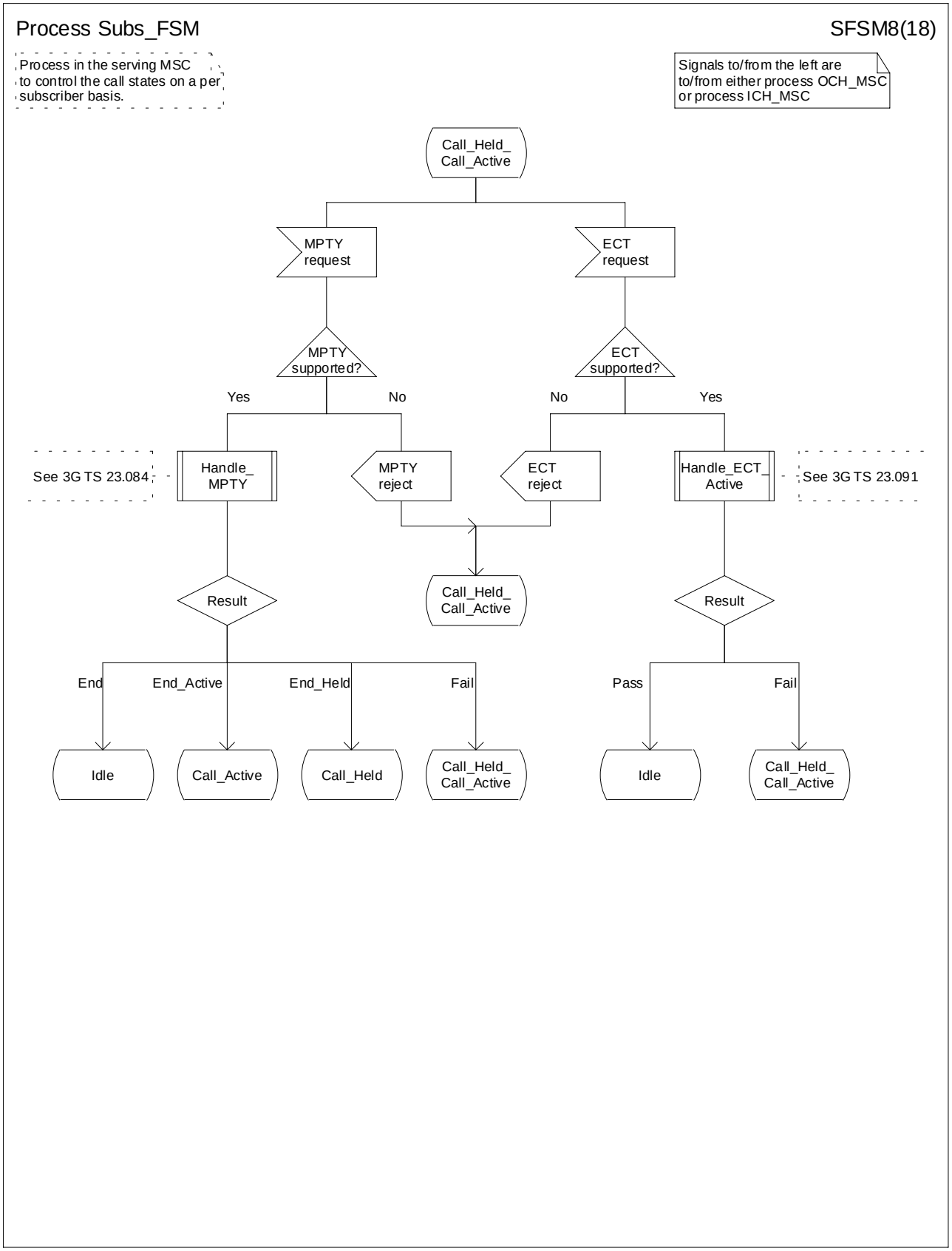
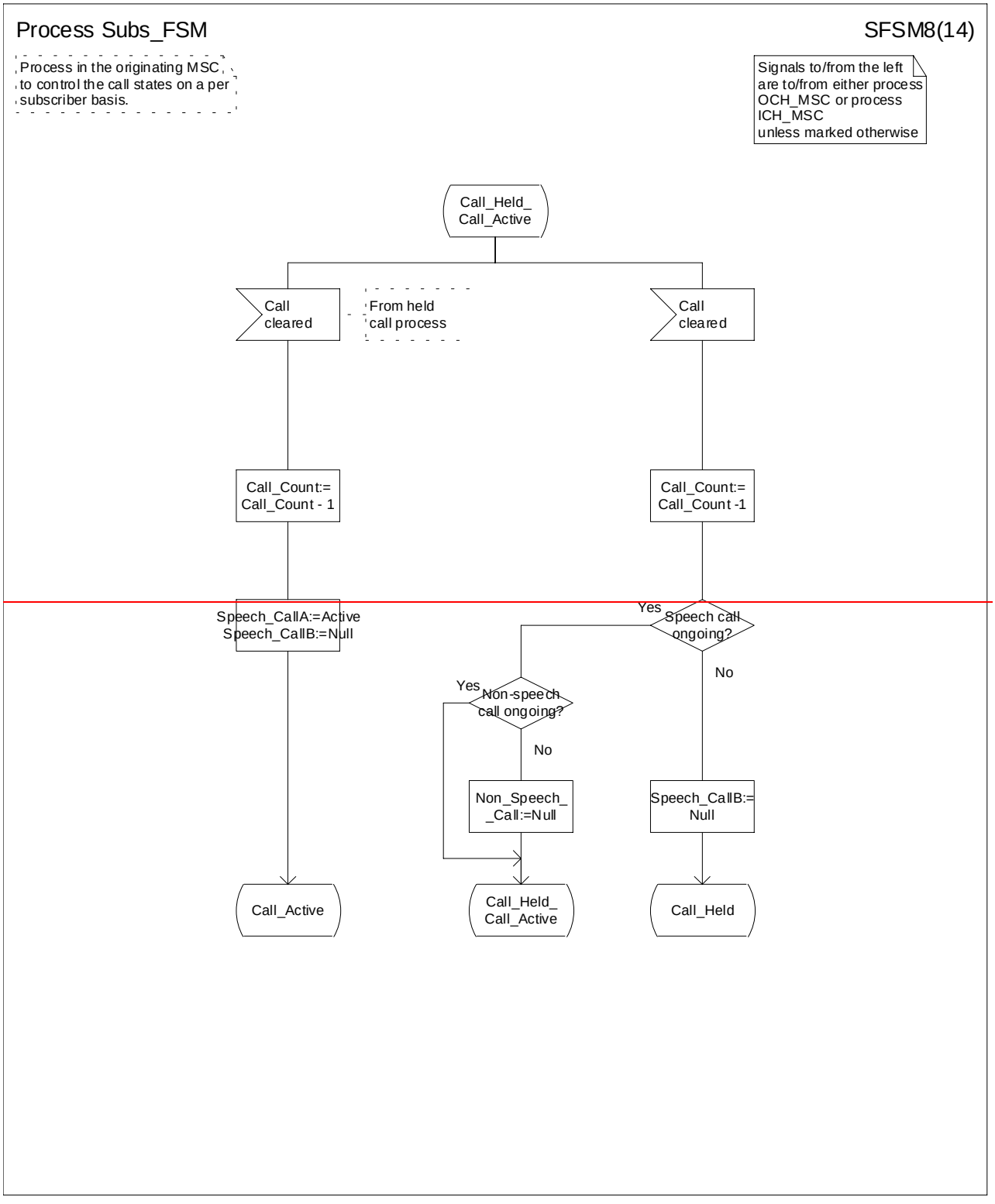


Figure 84h: Process Subs_FSM (sheet 8)


Process Subs_FSM
SFSM8(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC unless marked otherwise
Call_Held_ Call_Active
Call cleared
From held call process
Call cleared
Call_Count:= Call_Count - 1
Call_Count:= Call_Count -1
Speech_CallA:=Active Speech_CallB:=Null
Yes
Speech call ongoing?
No
Yes
Non-speech call ongoing?
No
Non_Speech_ _Call:=Null
Speech_CallB:= Null
Call_Active
Call_Held_ Call_Active
Call_Held

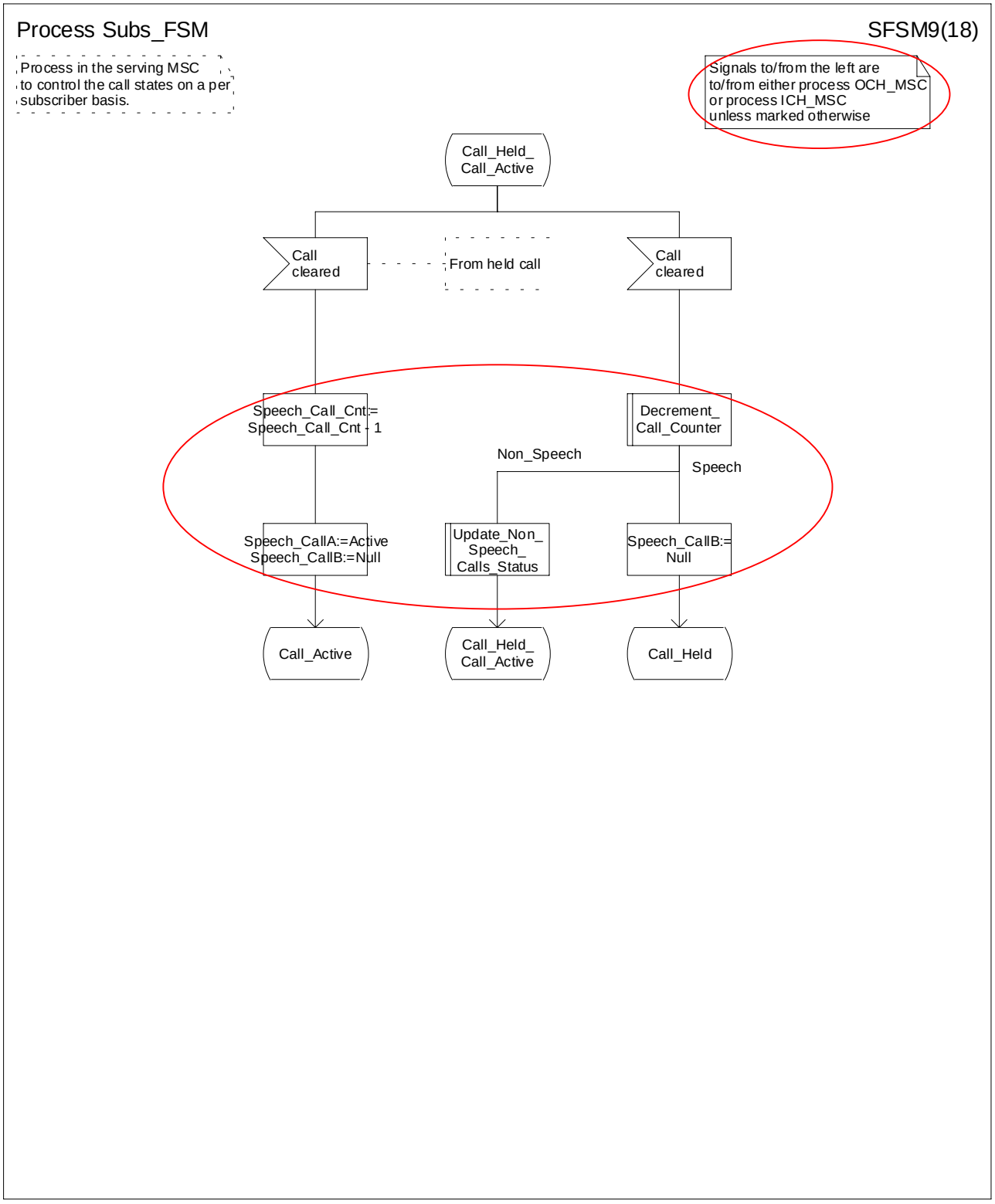
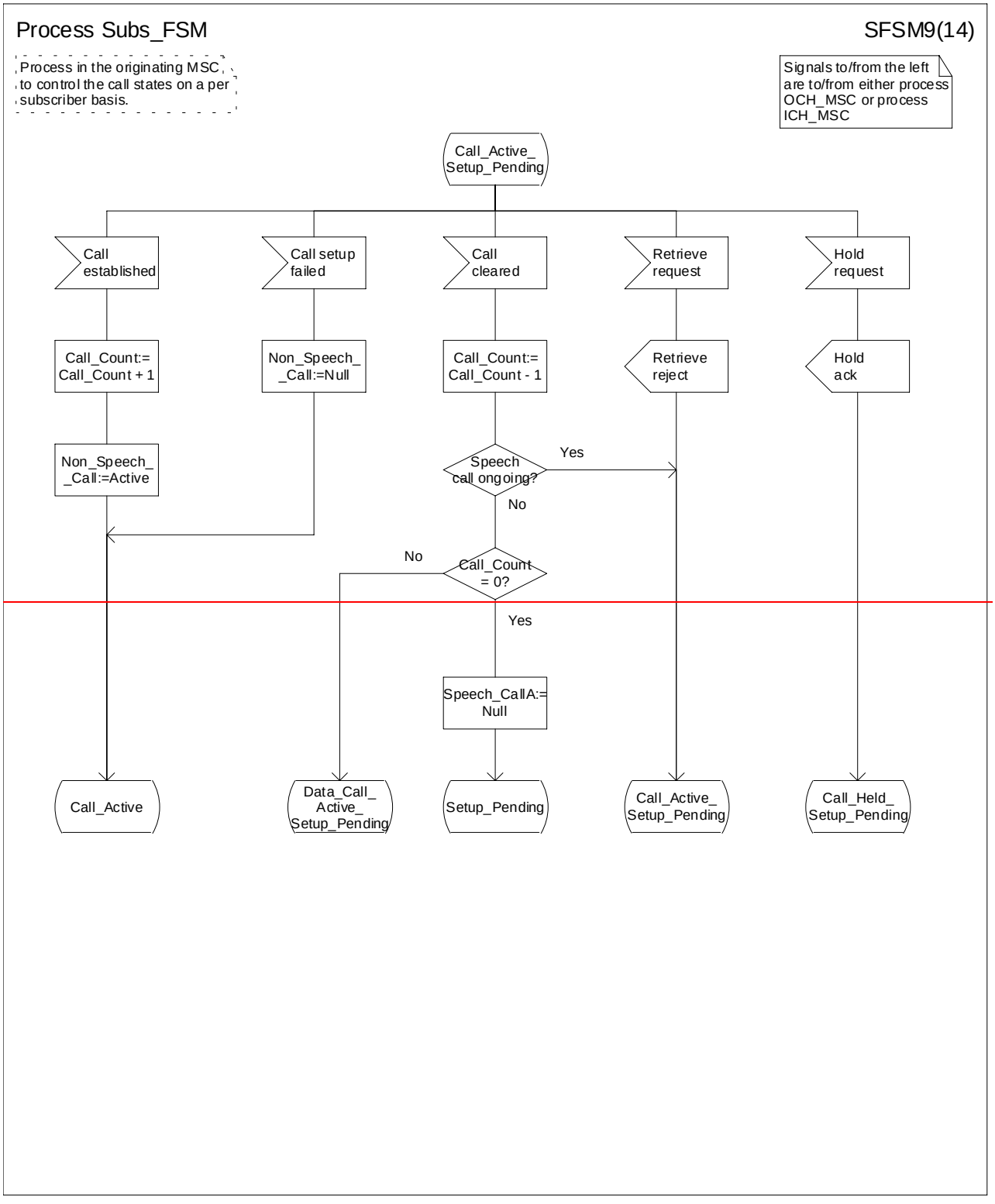


Figure 84~~i~~h: Process Subs_FSM (sheet ~~9~~8)


Process Subs_FSM
SFSM9(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Active_ Setup_Pending
Call established
Call setup failed
Call cleared
Retrieve request
Hold request
Call_Count:= Call_Count + 1
Non_Speech_ _Call:=Null
Call_Count:= Call_Count - 1
Retrieve reject
Hold ack
Non_Speech_ _Call:=Active
Speech call ongoing?
Yes
No
No
Call_Count = 0?
Yes
Speech_CallA:= Null
Call_Active
Data_Call_ Active_ Setup_Pending
Setup_Pending
Call_Active_ Setup_Pending
Call_Held_ Setup_Pending

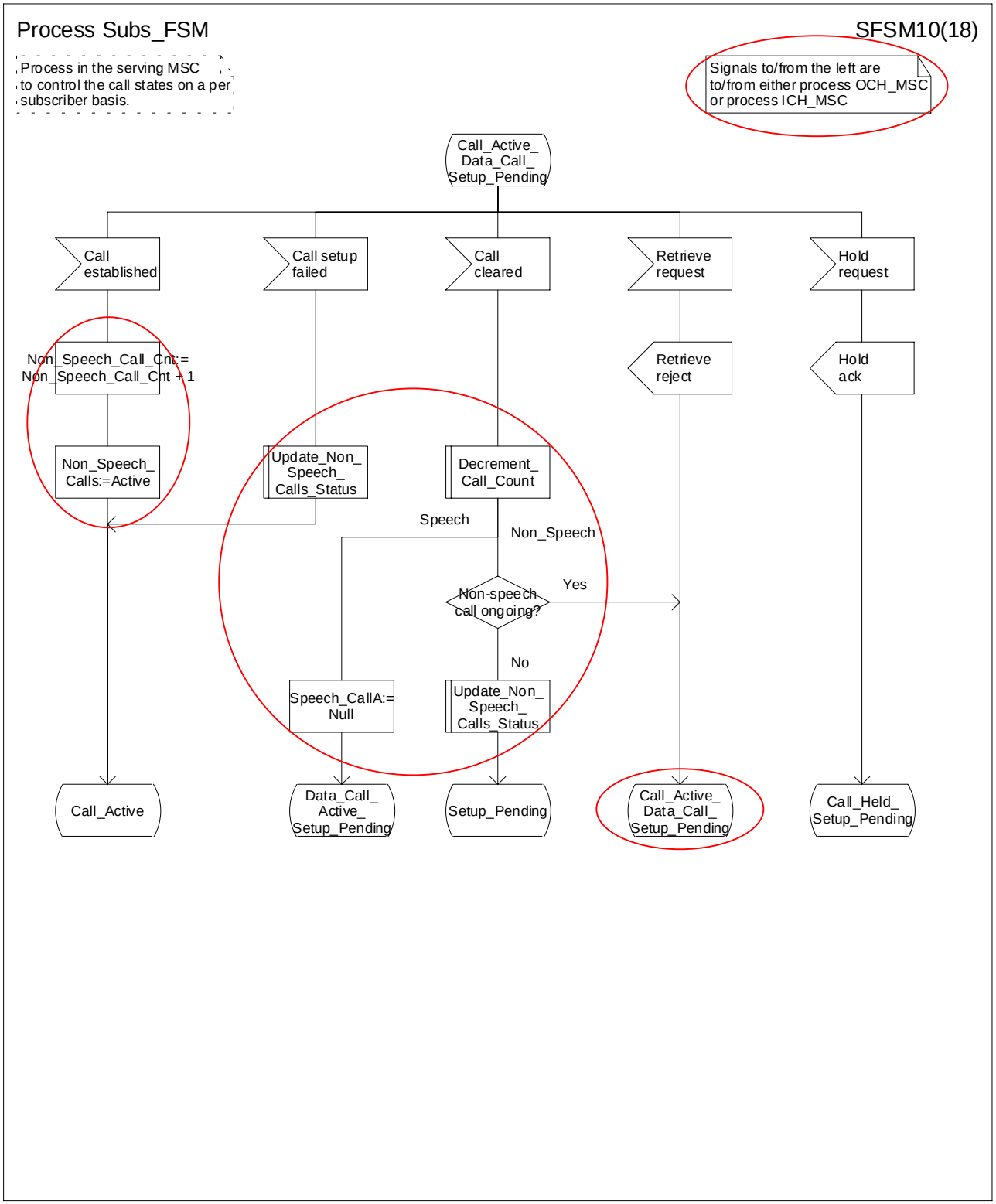
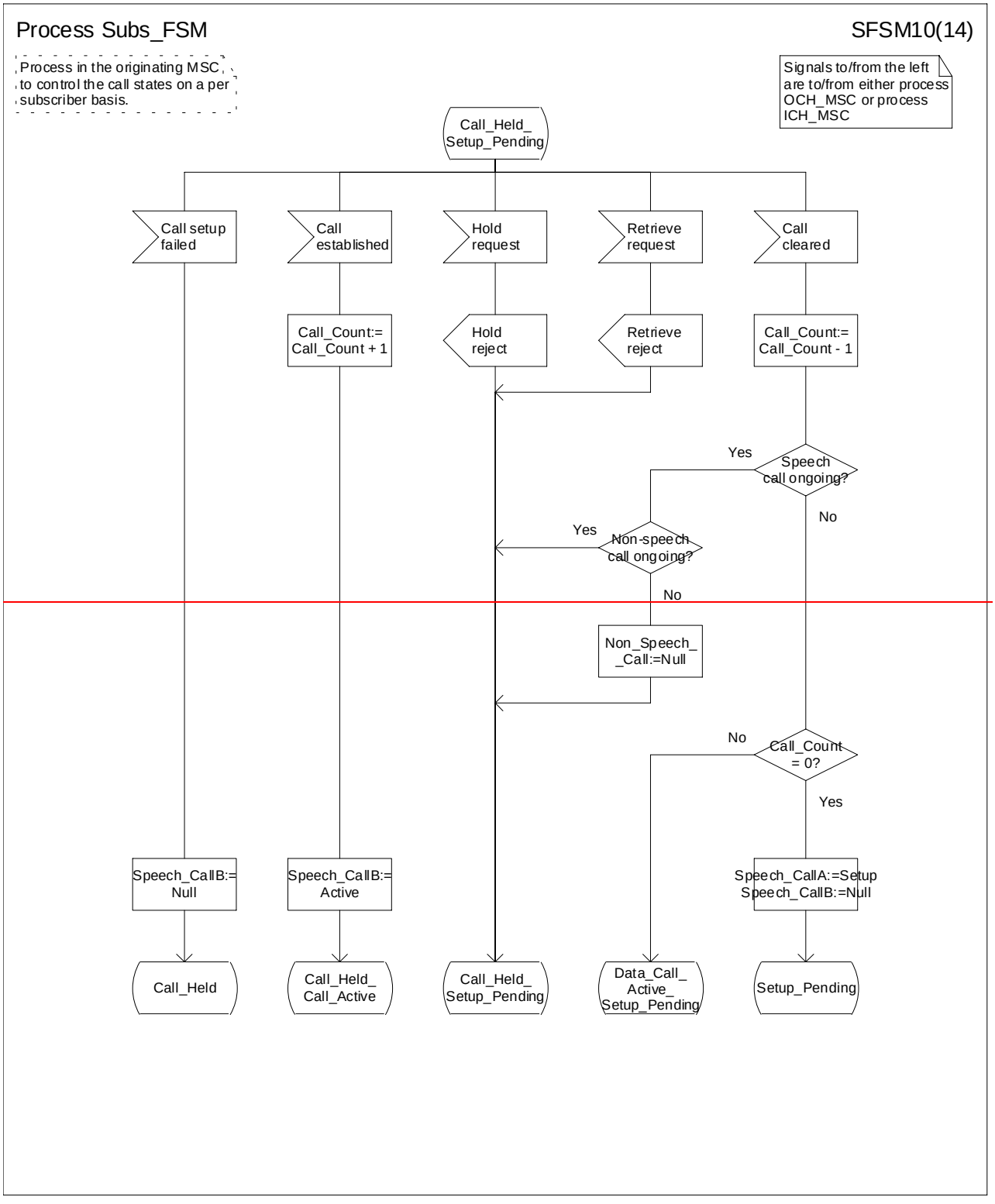


Figure 84ji: Process Subs_FSM (sheet 109)


Process Subs_FSM
SFSM10(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Held_ Setup_Pending
Call setup failed
Call established
Hold request
Retrieve request
Call cleared
Call_Count:= Call_Count + 1
Hold reject
Retrieve reject
Call_Count:= Call_Count - 1
Yes
Speech call ongoing?
No
Yes
Non-speech call ongoing?
No
Non_Speech_ _Call:=Null
No
Call_Count = 0?
Yes
Speech_CallB:= Null
Speech_CallB:= Active
Speech_CallA:=Setup Speech_CallB:=Null
Call_Held
Call_Held_ Call_Active
Call_Held_ Setup_Pending
Data_Call_ Active_ Setup_Pending
Setup_Pending

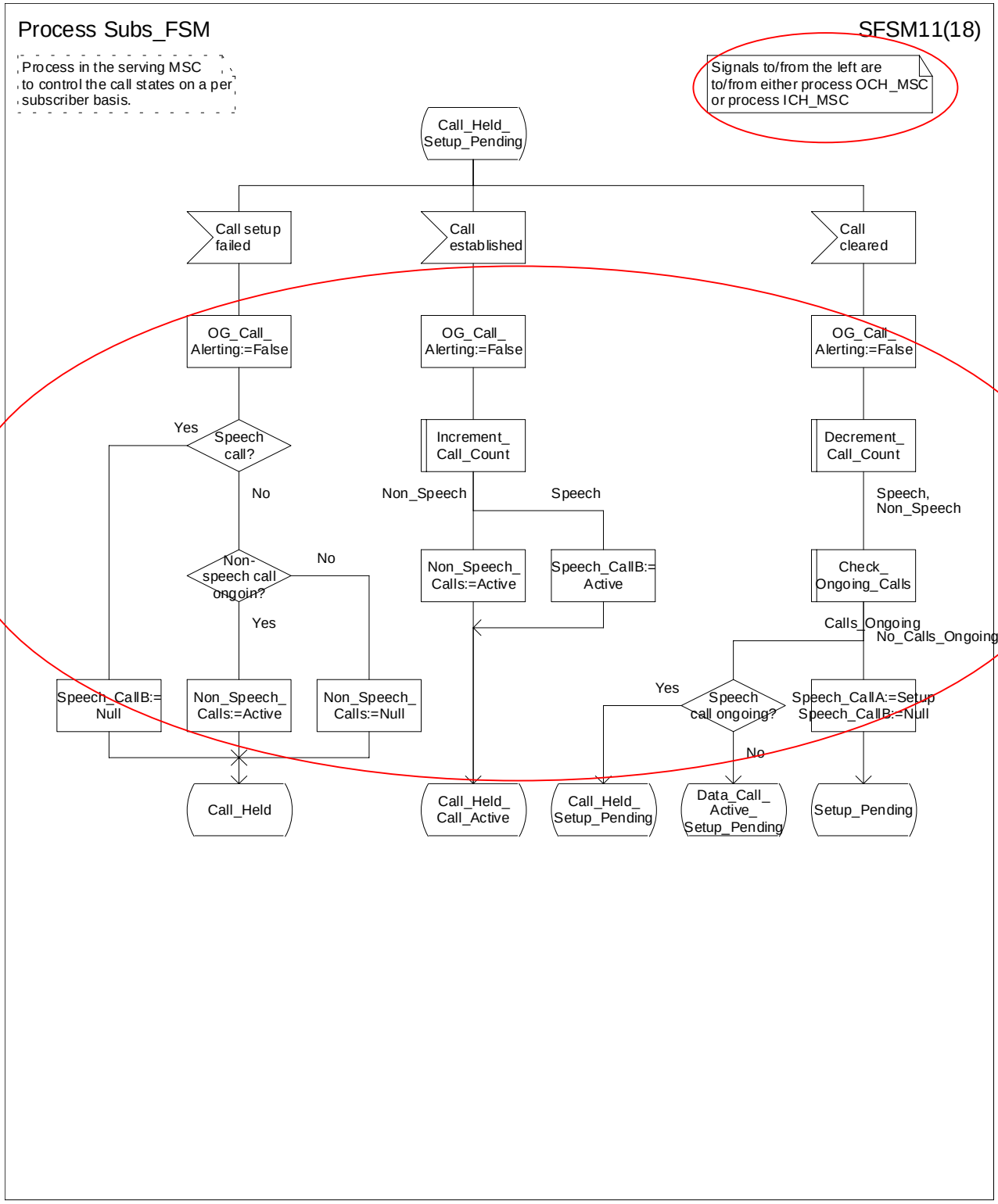


Figure 84kj: Process Subs_FSM (sheet 1110)

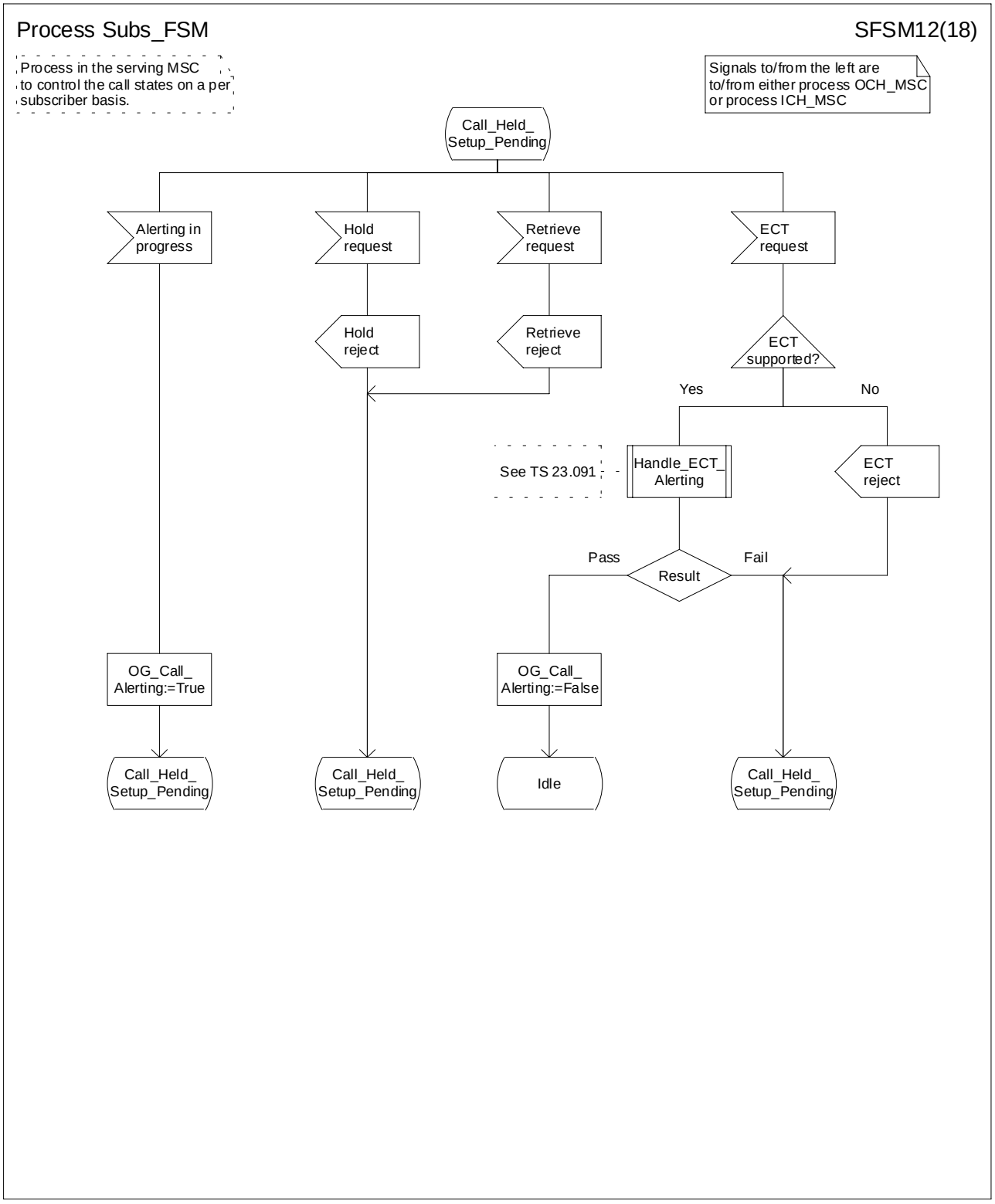
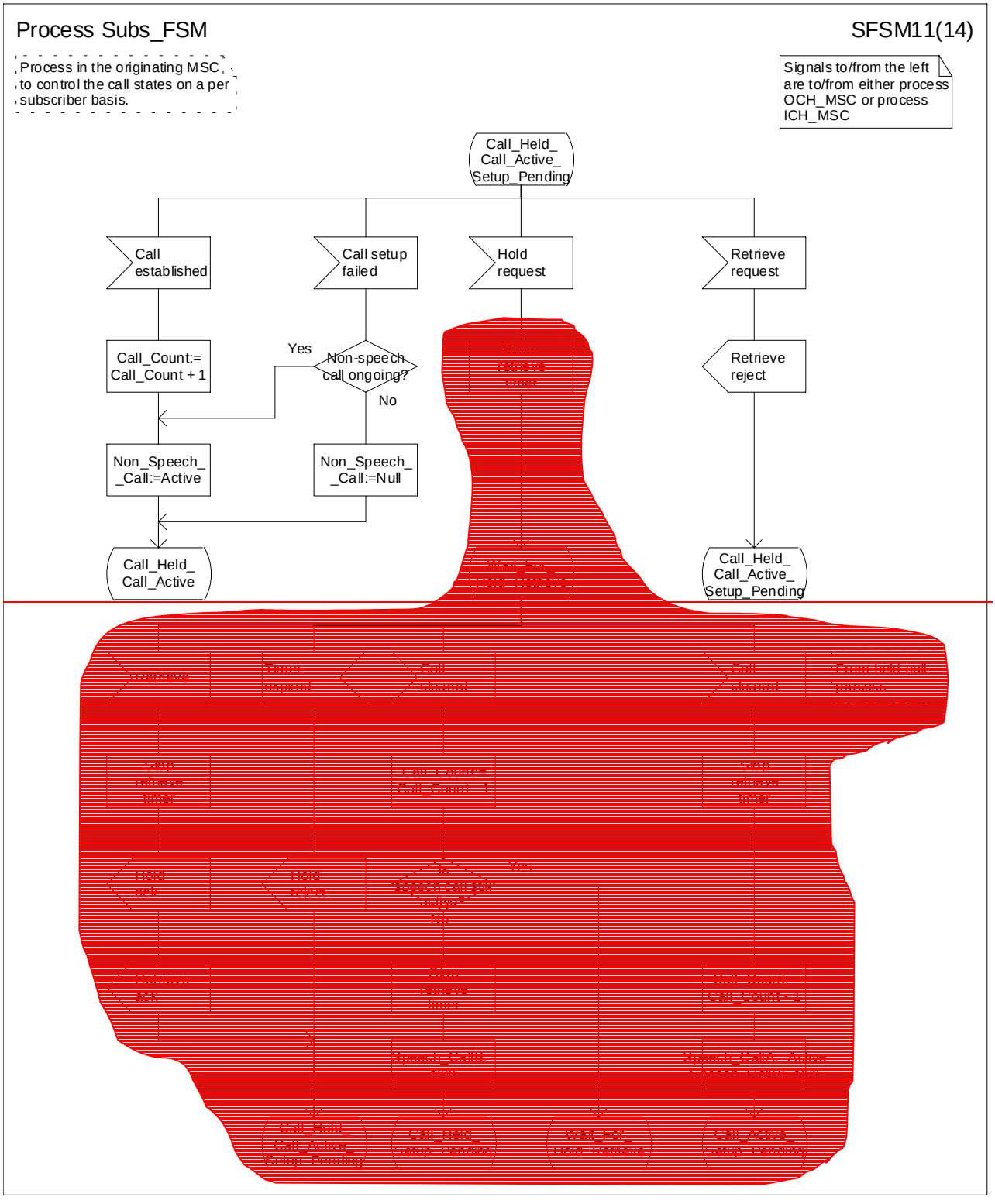


Figure 84l: Process Subs_FSM (sheet 12)


Process Subs_FSM
SFSM11(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Held_ Call_Active_ Setup_Pending
Call established
Call setup failed
Hold request
Retrieve request
Call_Count:= Call_Count + 1
Yes
Non-speech call ongoing?
No
Retrieve reject
Non_Speech_ _Call:=Active
Non_Speech_ _Call:=Null
Call_Held_ Call_Active
Call_Held_ Call_Active_ Setup_Pending

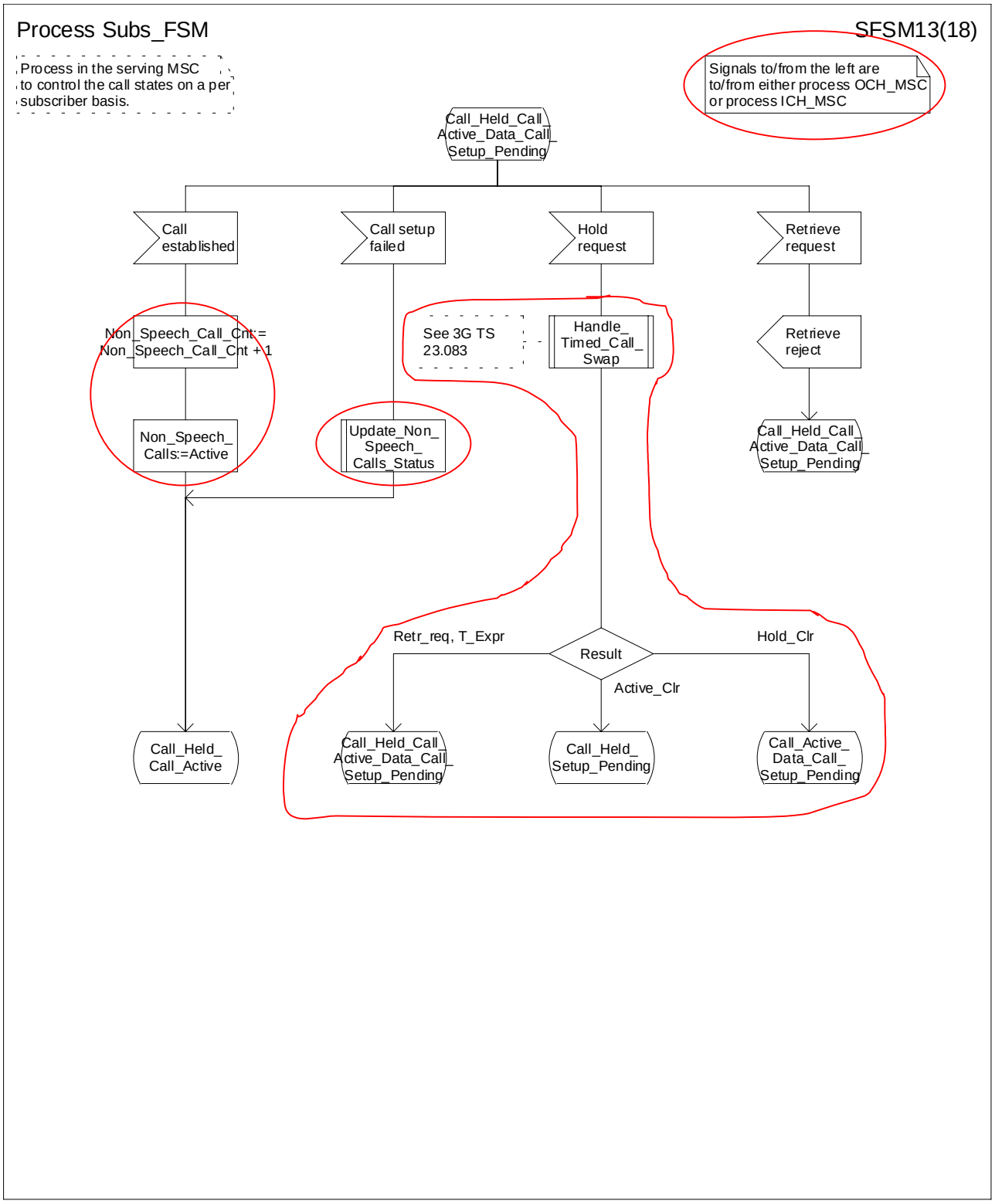
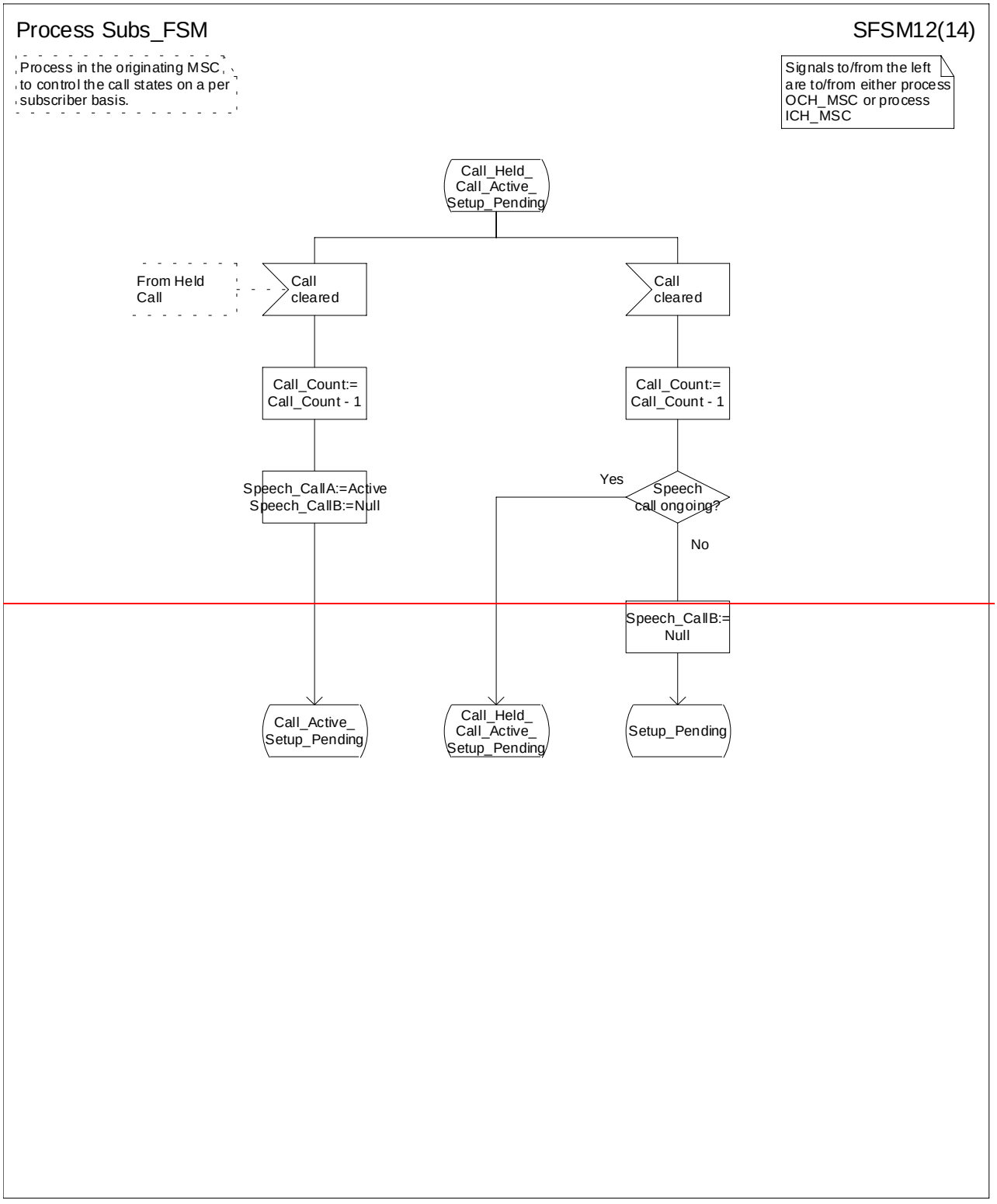


Figure 84mk: Process Subs_FSM (sheet 1311)


Process Subs_FSM
SFSM12(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Held_ Call_Active_ Setup_Pending
From Held Call
Call cleared
Call cleared
Call_Count:= Call_Count - 1
Call_Count:= Call_Count - 1
Speech_CallA:=Active Speech_CallB:=Null
Yes
Speech call ongoing?
No
Speech_CallB:= Null
Call_Active_ Setup_Pending
Call_Held_ Call_Active_ Setup_Pending
Setup_Pending

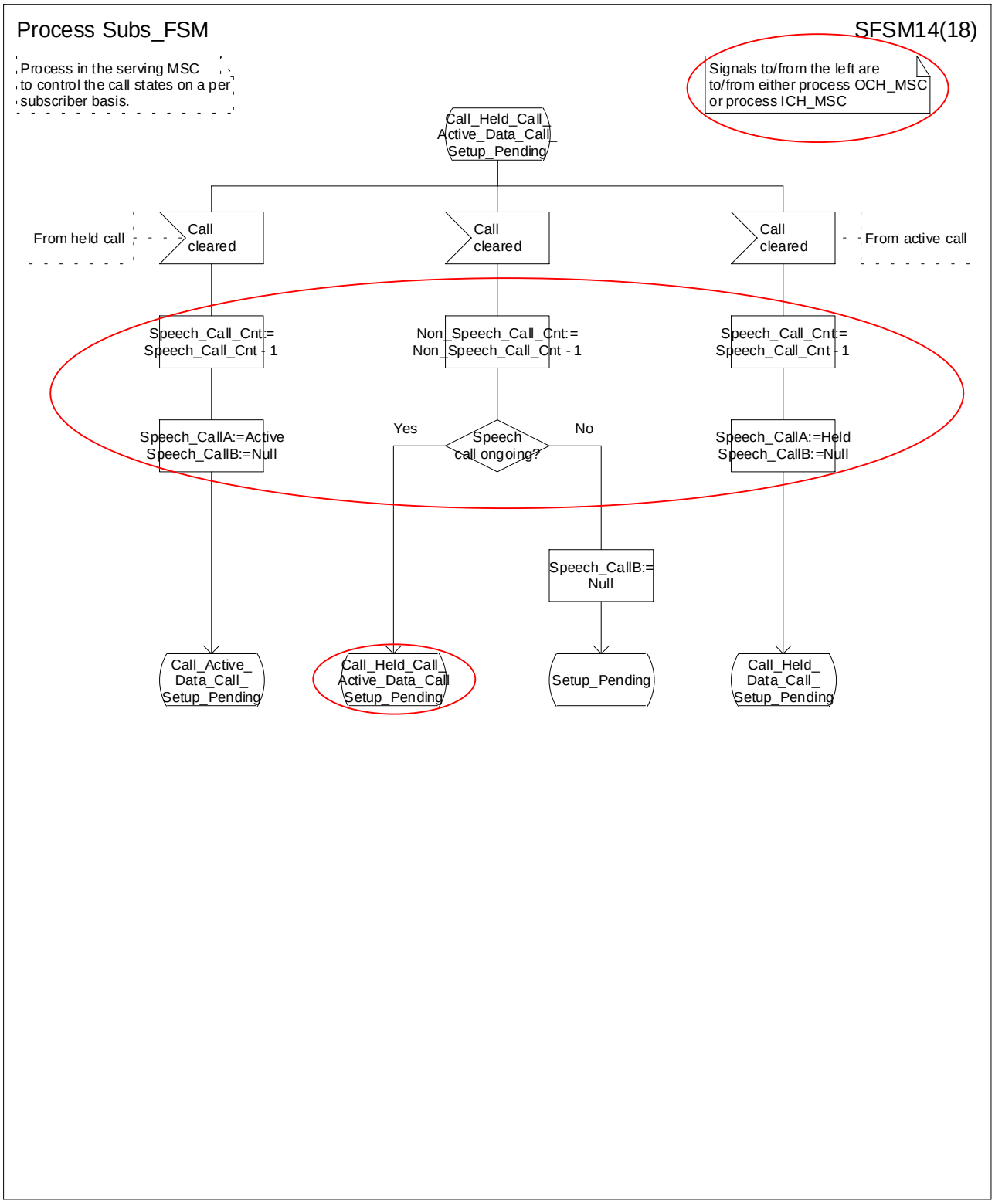
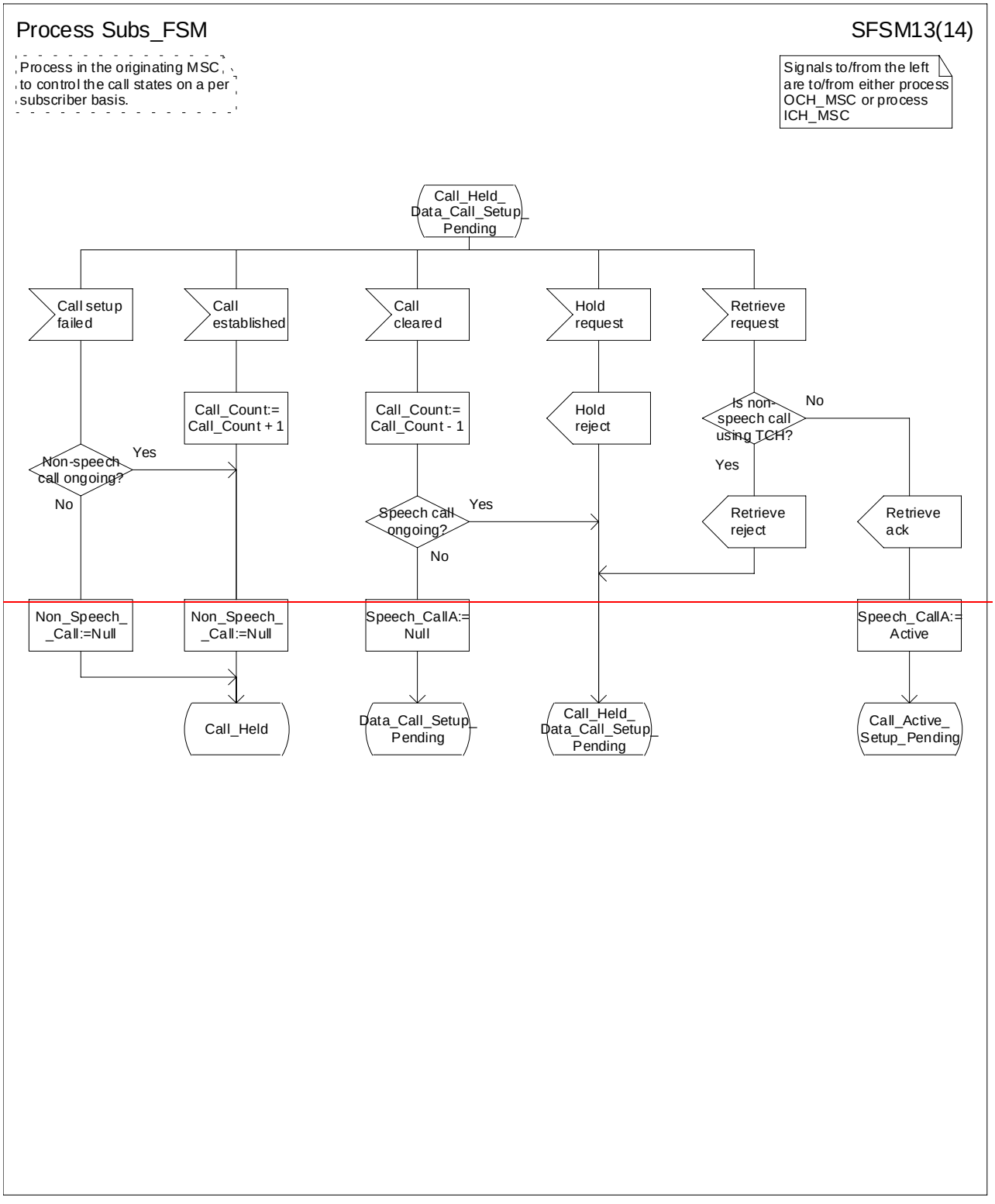


Figure 84nl: Process Subs_FSM (sheet 1412)


Process Subs_FSM
SFSM13(14)
Process in the originating MSC to control the call states on a per subscriber basis.
Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC
Call_Held_ Data_Call_Setup_ Pending
Call setup failed
Call established
Call cleared
Hold request
Retrieve request
Call_Count:= Call_Count + 1
Call_Count:= Call_Count - 1
Hold reject
Is non-speech call using TCH?
No
Yes
Non-speech call ongoing?
Yes
No
Speech call ongoing?
Yes
No
Retrieve reject
Retrieve ack
Non_Speech_ _Call:=Null
Non_Speech_ _Call:=Null
Speech_CallA:= Null
Speech_CallA:= Active
Call_Held
Data_Call_Setup_ Pending
Call_Held_ Data_Call_Setup_ Pending
Call_Active_ Setup_Pending

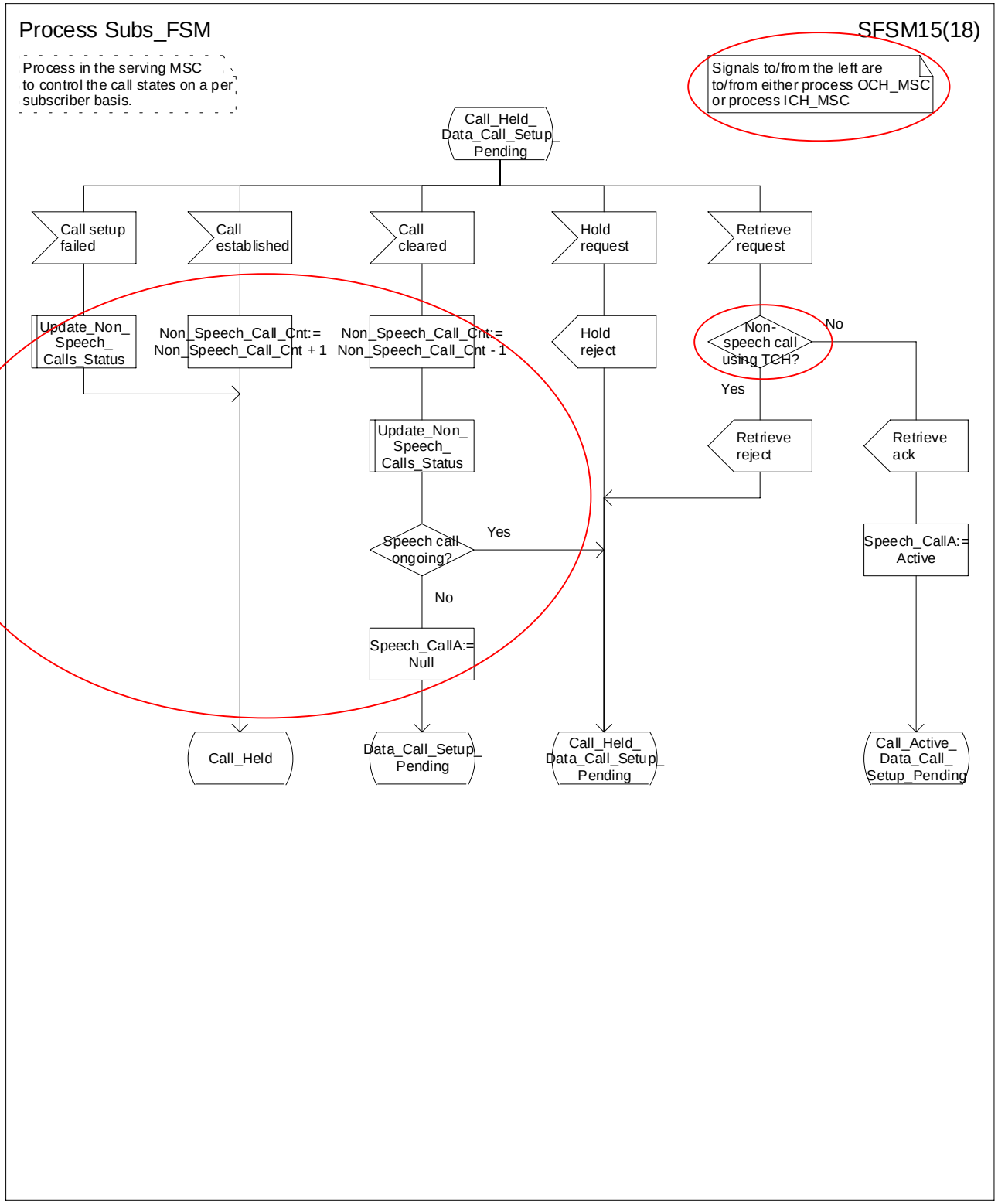
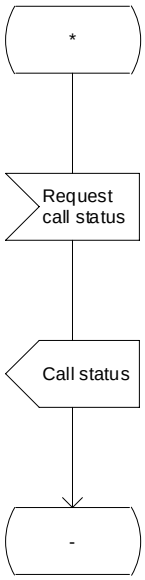


Figure 84~~o~~m: Process Subs_FSM (sheet 15~~13~~)

Process Subs_FSM SFSM14(14)

Process in the originating MSC to control the call states on a per subscriber basis.

Signals to/from the left are to/from either process OCH_MSC or process ICH_MSC



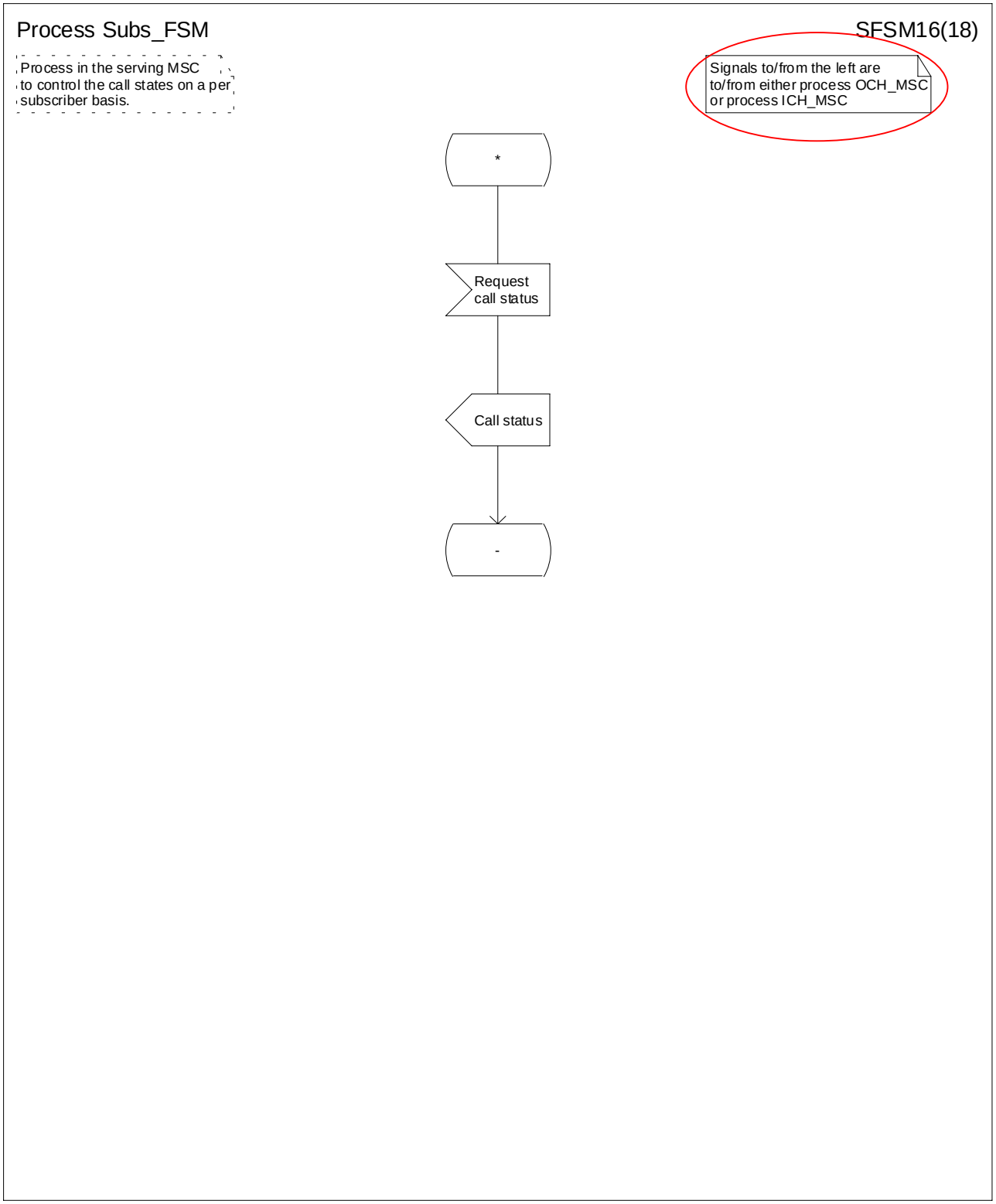


Figure 84~~p~~n: Process Subs_FSM (sheet 16~~14~~)

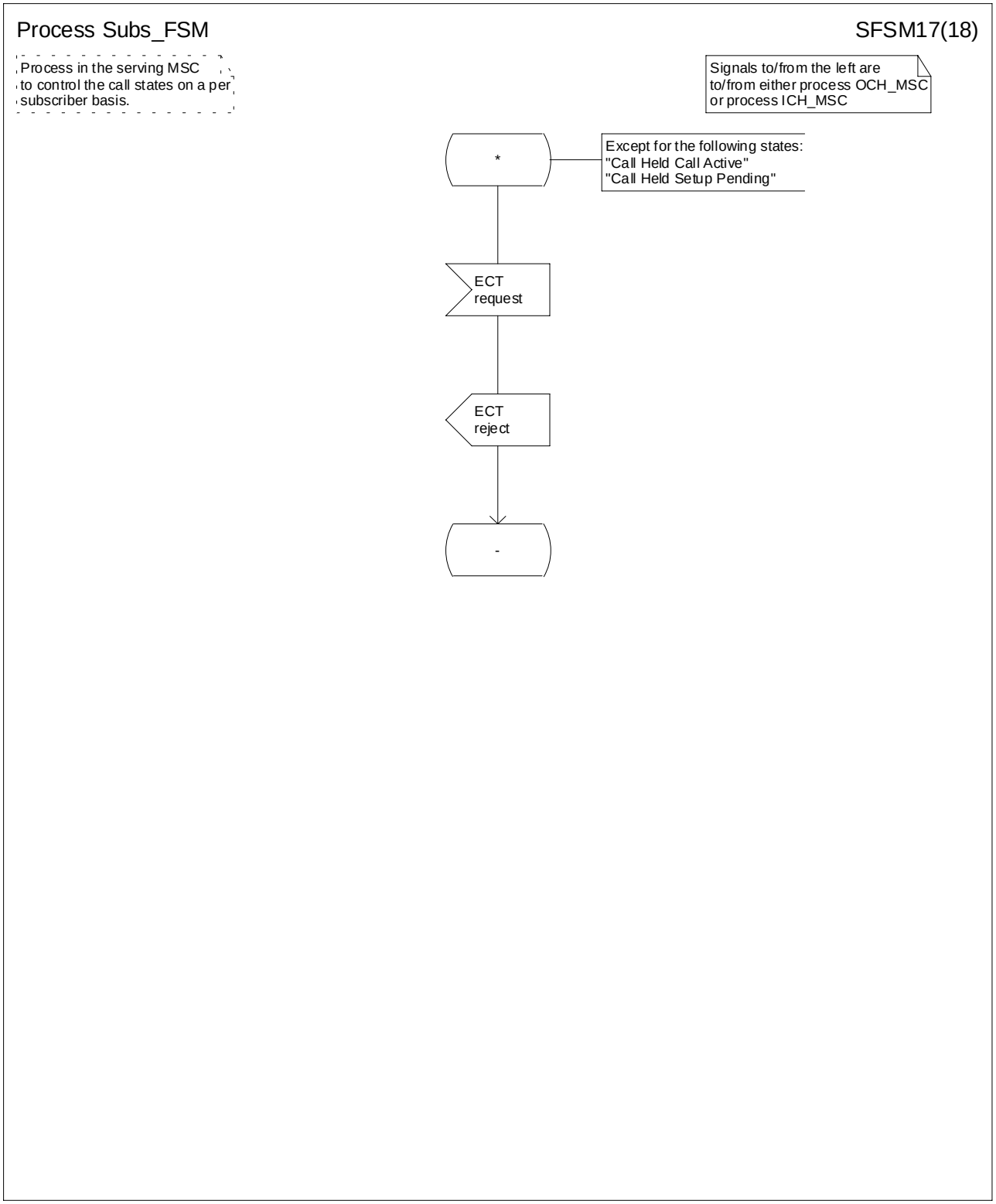


Figure 84q: Process Subs_FSM (sheet 17)

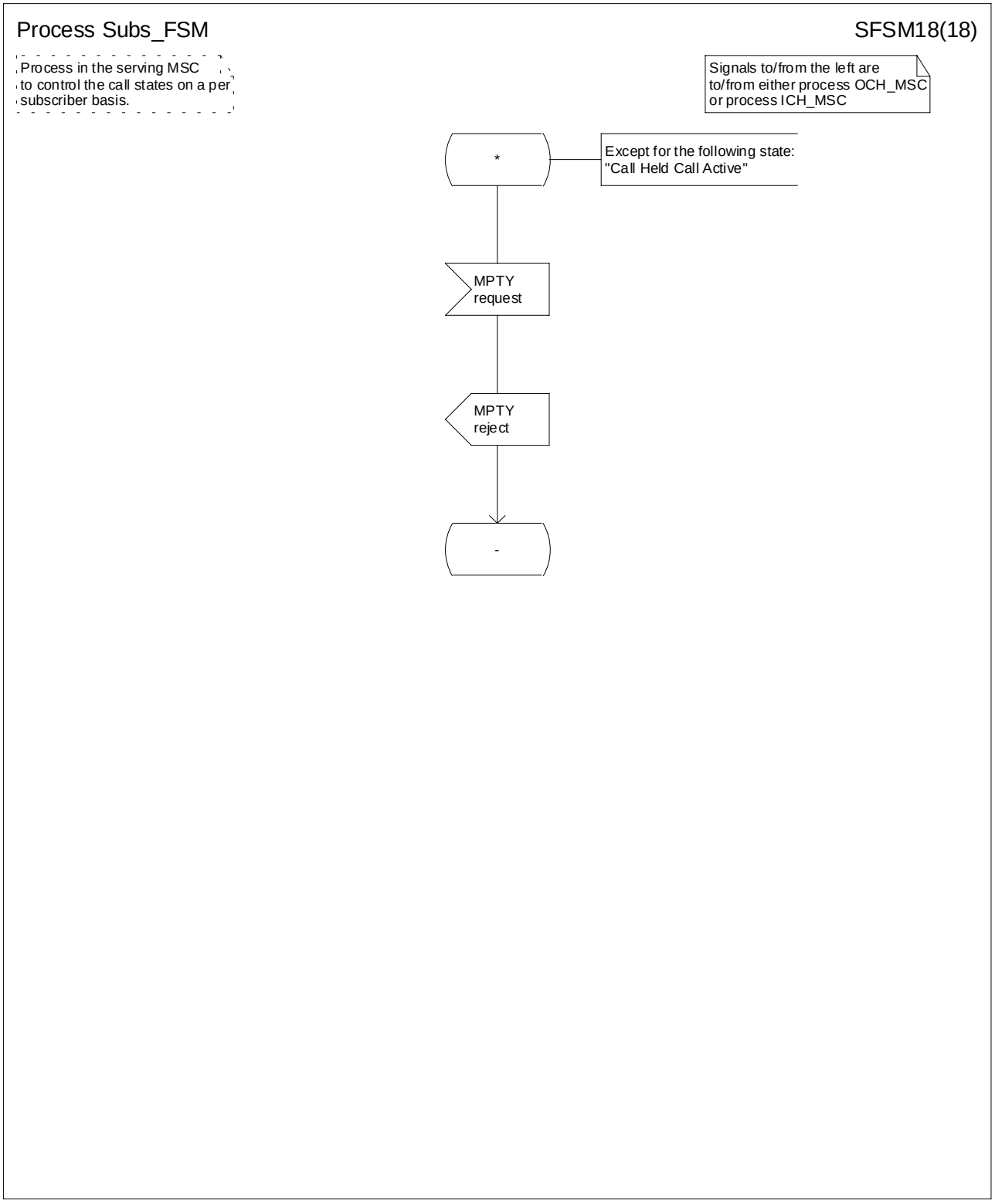


Figure 84r: Process Subs_FSM (sheet 18)

Macrodefinition Check_Ongoing_Calls COC1(1)

Macro to check if there are any speech or non-speech calls remaining (and also update the Non_Speech_Calls status variable.

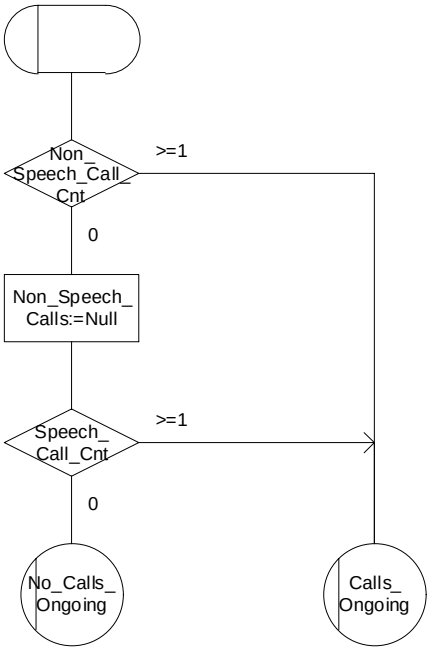


Figure 85: Macro Check_Ongoing_Calls

Macrodefinition Update_Non_Speech_Calls_Status Upd_NSC_Stat1(1)

Macro to update the Non_Speeh_Calls variable depending on whether there are any non-speech calls ongoing or not.

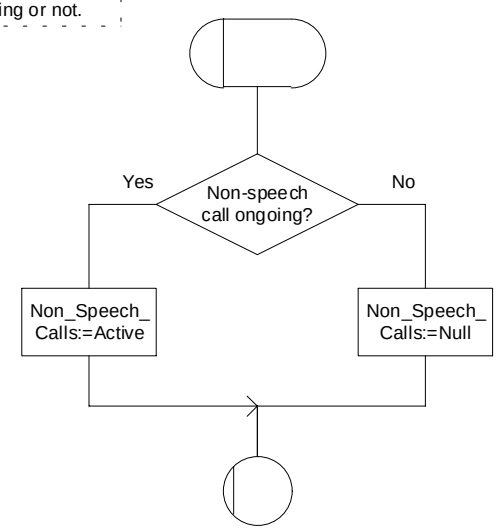


Figure 86: Macro Update_Non_Speech_Calls_Status

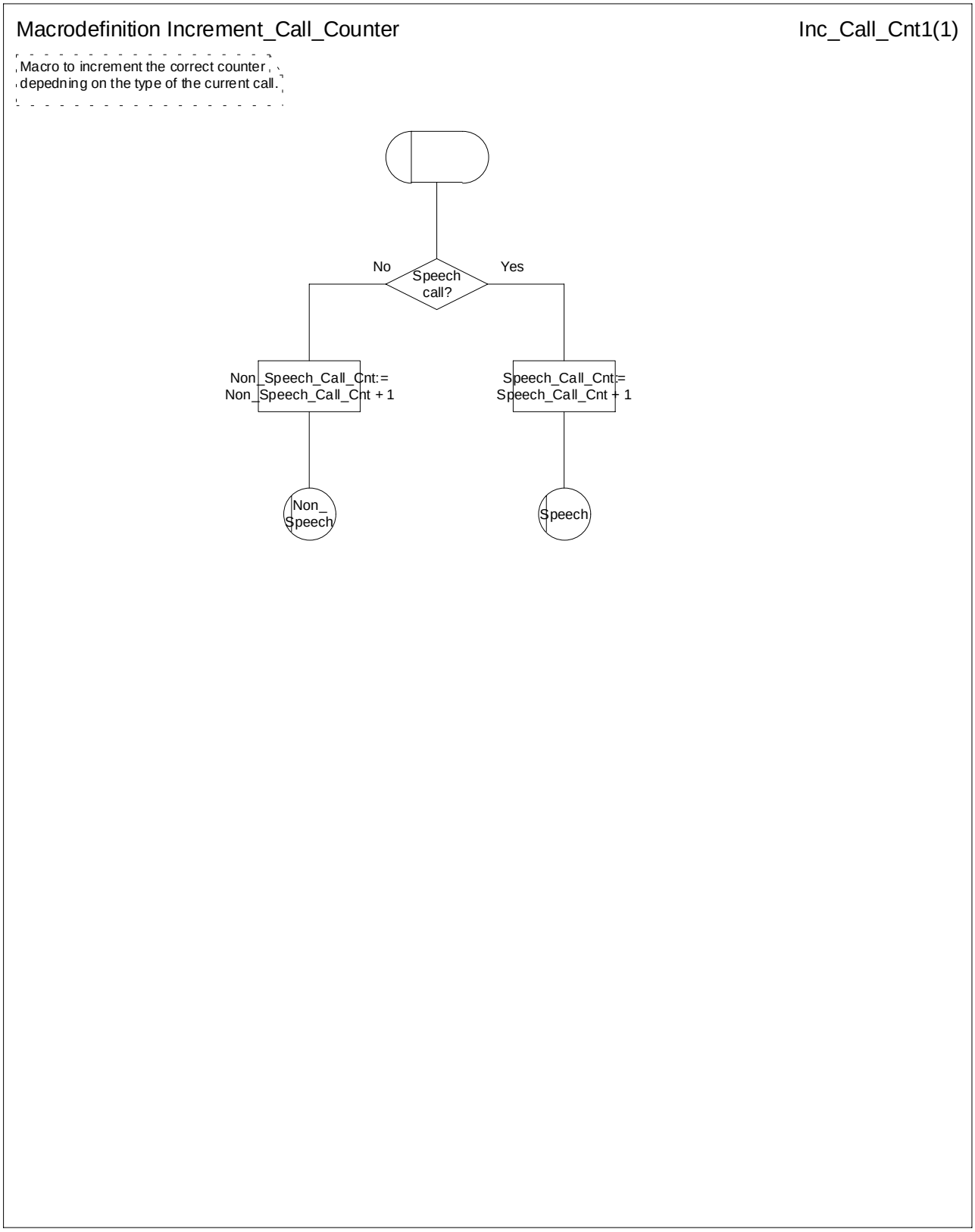


Figure 87: Macro Increment_Call_Counter

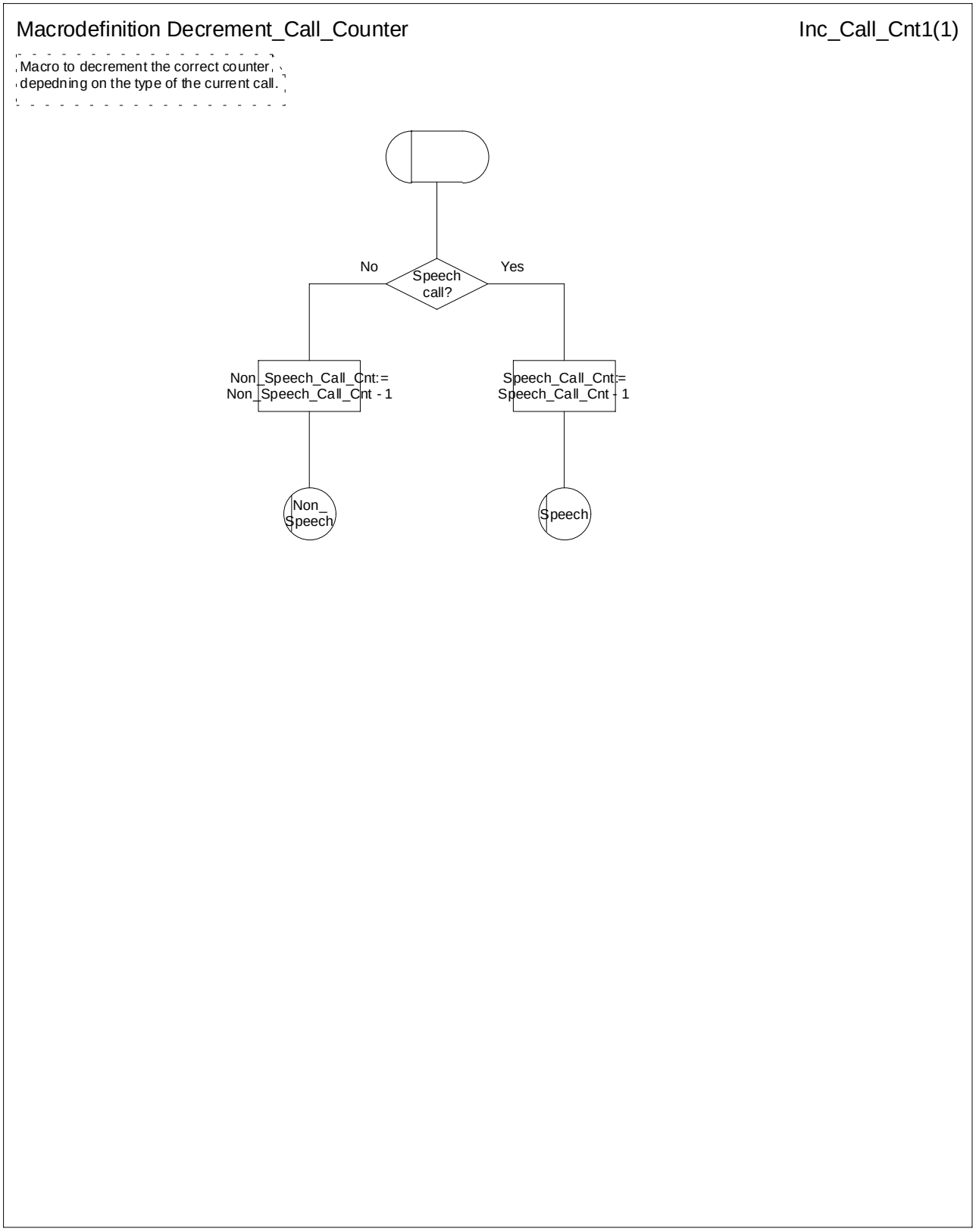


Figure 88: Macro Decrement_Call_Counter

3GPP TSG-CN4 Meeting #07
Sophia Antipolis, France, 26/2-2/3/01

Tdoc N4-010357

CR-Form-v3

CHANGE REQUEST

⌘ **23.018** **CR** **067** ⌘ rev **-** ⌘ Current version: **4.1.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Removal of CW descriptions
Source:	⌘	CN4
Work item code:	⌘	TEI
Date:	⌘	20/02/01
Category:	⌘	**C**
Release:	⌘	REL-4

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

Use one of the following releases:

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

Reason for change:	⌘	The handling of Call Waiting should be specified in the relevant Supplementary Service TS (3G TS 23.083).
Summary of change:	⌘	Removal of the procedure Process_Call_Waiting_MSC from this TS.
Consequences if not approved:	⌘	

Clauses affected:	⌘				
Other specs affected:	⌘	**X**	Other core specifications	⌘	Linked to 23.083 (CR 007)
		☐	Test specifications		
		☐	O&M Specifications		
Other comments:	⌘				

7.3 MT call

7.3.1 Functional requirements of serving MSC

7.3.1.1 Process ICH_MSC

. . .

specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL phase 3 or later, 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 or later.

Sheet 3: If the VMSC does not support CAMEL phase 3 or later, 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: the procedure Process_Call_Waiting is specific to Call Waiting; it is specified in 3GPP TS 23.083 [16].

Sheet 3, sheet 8, the procedure CD_Reject is specific to Call Deflection; it is specified in 3GPP TS 23.072 [11].

Sheet 3, sheet 8: the procedure CCBS_Set_Diagnostic_For_Release is specific to CCBS; it is specified in 3GPP TS 23.093 [22].

Sheet 3, sheet 4, sheet 10, sheet 11: the procedure CCBS_Check_Last_Call is specific to CCBS; it is specified in 3GPP TS 23.093 [22].

Sheet 3, sheet 11, sheet 13: signals are sent to and received from the process Subs_FSM; it is specified in subclause 7.4.

Sheet 4: the procedure UUS_ICH_Check_Support is specific to UUS; it is specified in 3GPP TS 23.087 [20].

. . .

~~7.3.1.5 Procedure Process_Call_Waiting_MSC~~

~~Sheet 1: the procedure Set_CLIP_Info_MSC is specific to CLIP.~~

~~Sheet 1: the VMSC and the MS may negotiate the bearer capability to be used for the call by the exchange of information in the Set-up and Call Confirmed messages.~~

~~Sheet 1: the Call Confirmed message indicates "busy" for the successful case.~~

~~Sheet 1: the procedure Establish_Terminating_TCH_Multicall1 is specific to Multicall; it is specified in 3GPP TS 23.135 [24]. If the VMSC does not support Multicall, processing continues from the “Yes” exit of the test “Result=Pass?”.~~

~~Sheet 1: the procedure UUS_ICH_UUS1_Implicit_Active is specific to UUS; it is specified in 3GPP TS 23.087 [20].~~

~~Sheet 1: the procedure CCBS_Report_Not_Idle is specific to CCBS; it is specified in 3GPP TS 23.093 [22].~~

~~Sheet 2, sheet 3, sheet 5: the procedure UUS_ICH_Check_Support is specific to UUS; it is specified in 3GPP TS 23.087 [20]. If the VMSC does not support UUS, processing continues from the "Yes" exit of the test "Result=Pass?" where the test follows the procedure call.~~

~~Sheet 2: the procedure CCBS_ICH_MSC_Report_Success is specific to CCBS; it is specified in 3GPP TS 23.093 [22].~~

~~Sheet 2: the task "UTU2Cnt:=0" is executed only if the VMSC supports UUS.~~

~~Sheet 2: the procedure CAMEL_Start_TNRy is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12].~~

~~Sheet 2: the procedure Send_ACM_If_Required is specified in subclause 7.2.1.3.~~

~~Sheet 2, sheet 8: the processing in the branch starting with the input "CD Request" is specific to Call Deflection; if the VMSC does not support Call Deflection the input is discarded.~~

~~Sheet 2, sheet 8: the procedure Handling_CD_MSC is specific to Call Deflection; it is specified in 3GPP TS 23.072 [11].~~

~~Sheet 2, sheet 3, sheet 6, sheet 7: the procedure CAMEL_MT_GMSC_DISC4 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "No" exit of the test "Result=Reconnect?".~~

~~Sheet 2, sheet 3, sheet 4, sheet 8: the procedure CCBS_ICH_MSC_Report_Failure is specific to CCBS; it is specified in 3GPP TS 23.093 [22].~~

~~Sheet 3, sheet 7: the Release transaction (reject) message covers all unsuccessful cases not otherwise indicated.~~

~~Sheet 4, sheet 7: the procedure UUS_MSC_Check_UUS1_UUI is specific to UUS; it is specified in 3GPP TS 23.087 [20].~~

~~Sheet 4, sheet 8: the procedure CAMEL_MT_GMSC_DISC6 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12].~~

~~Sheet 5: the procedure CAMEL_Stop_TNRy is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12].~~

~~Sheet 5: the procedure Establish_Terminating_TCH_Multicall is specific to Multicall; it is specified in 3GPP TS 23.135 [34].~~

~~Sheet 6: the procedure Handle_AoC_MT_MSC is specific to AoC. If the VMSC does not support AoC, processing continues from the "Yes" exit of the test "Result=Pass?".~~

~~Sheet 6: the procedure CAMEL_MT_GMSC_ANSWER is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "Yes" exit of the test "Result=Pass?" on sheet 6.~~

~~Sheet 6: the procedure Set_COL_Presentation_Indicator_MSC is specific to COLP.~~

~~Sheet 6: the procedure Send_Answer_If_Required is specified in subclause 7.2.1.4.~~

~~Sheet 7: the input signal "CAMEL TNRy expired" will be received only if the VMSC supports CAMEL phase 3 or later.~~

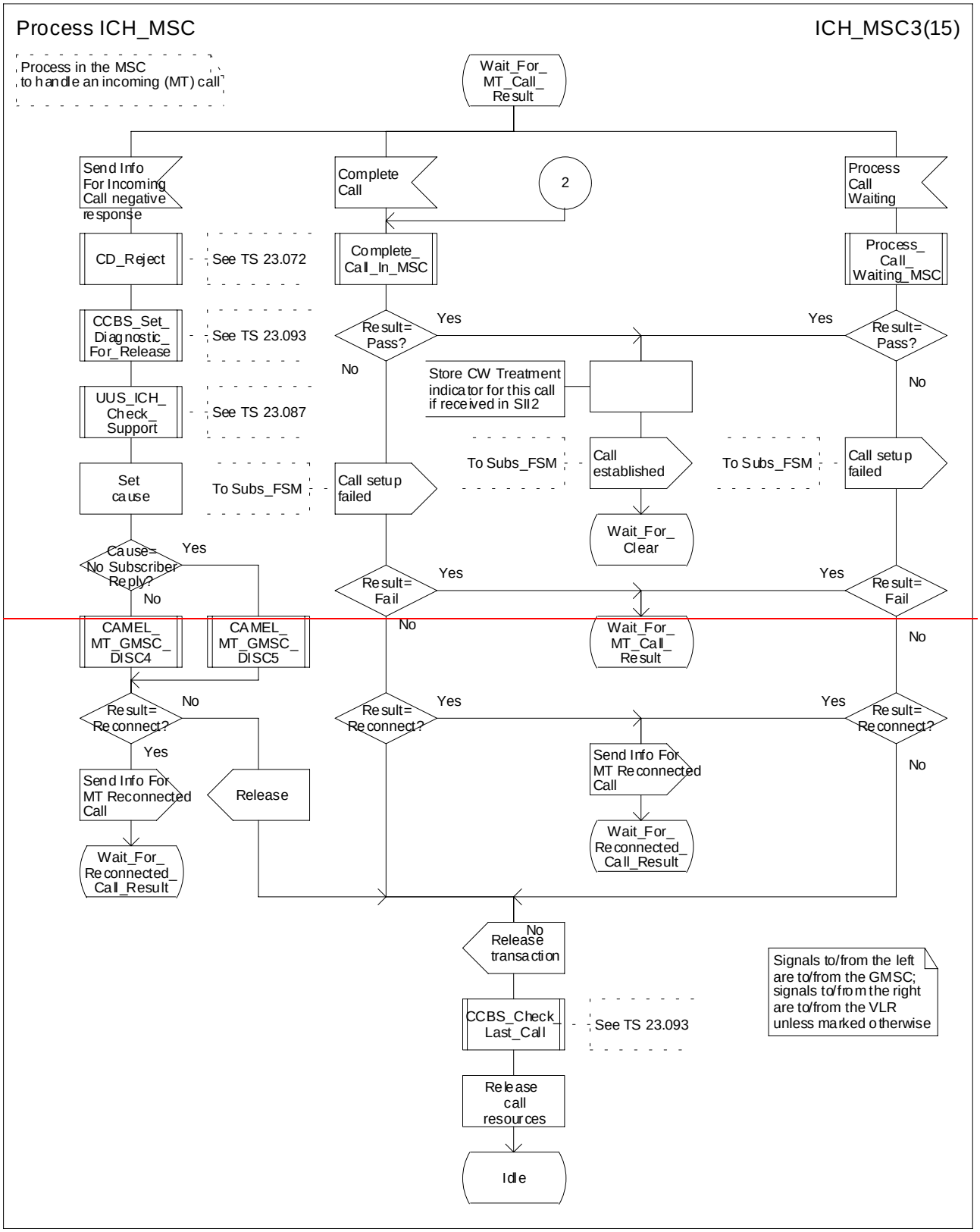
~~Sheet 7: the procedure CAMEL_MT_GMSC_DISC5 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [12]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "No" exit of the test "Result=Reconnect?".~~

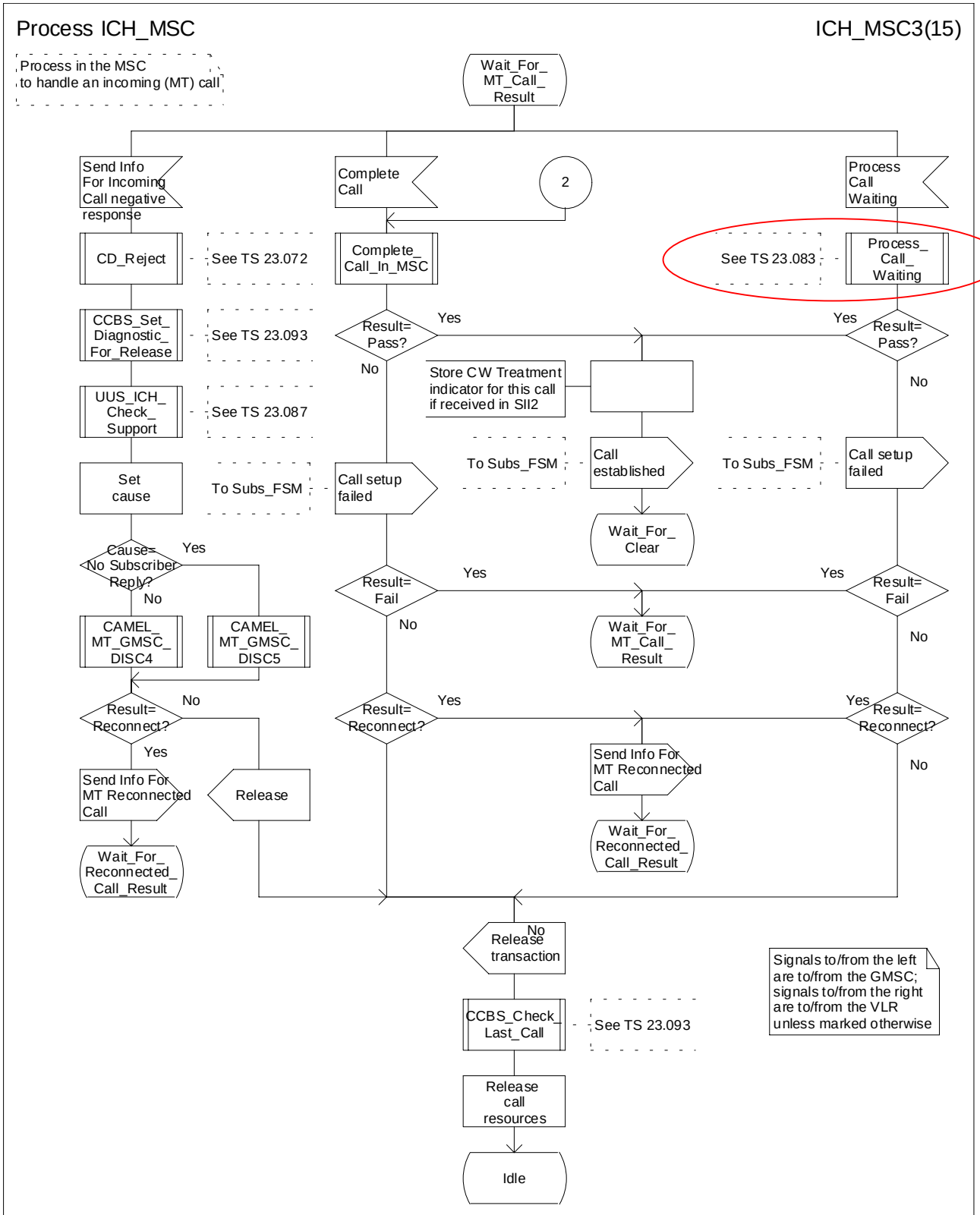
~~Sheet 7, sheet 8: the procedure UUS_ICH_Check_Forwarding is specific to UUS; it is specified in 3GPP TS 23.087 [20]. If the VMSC does not support UUS, processing continues from the "Yes" exit of the test "Result=Pass?".~~

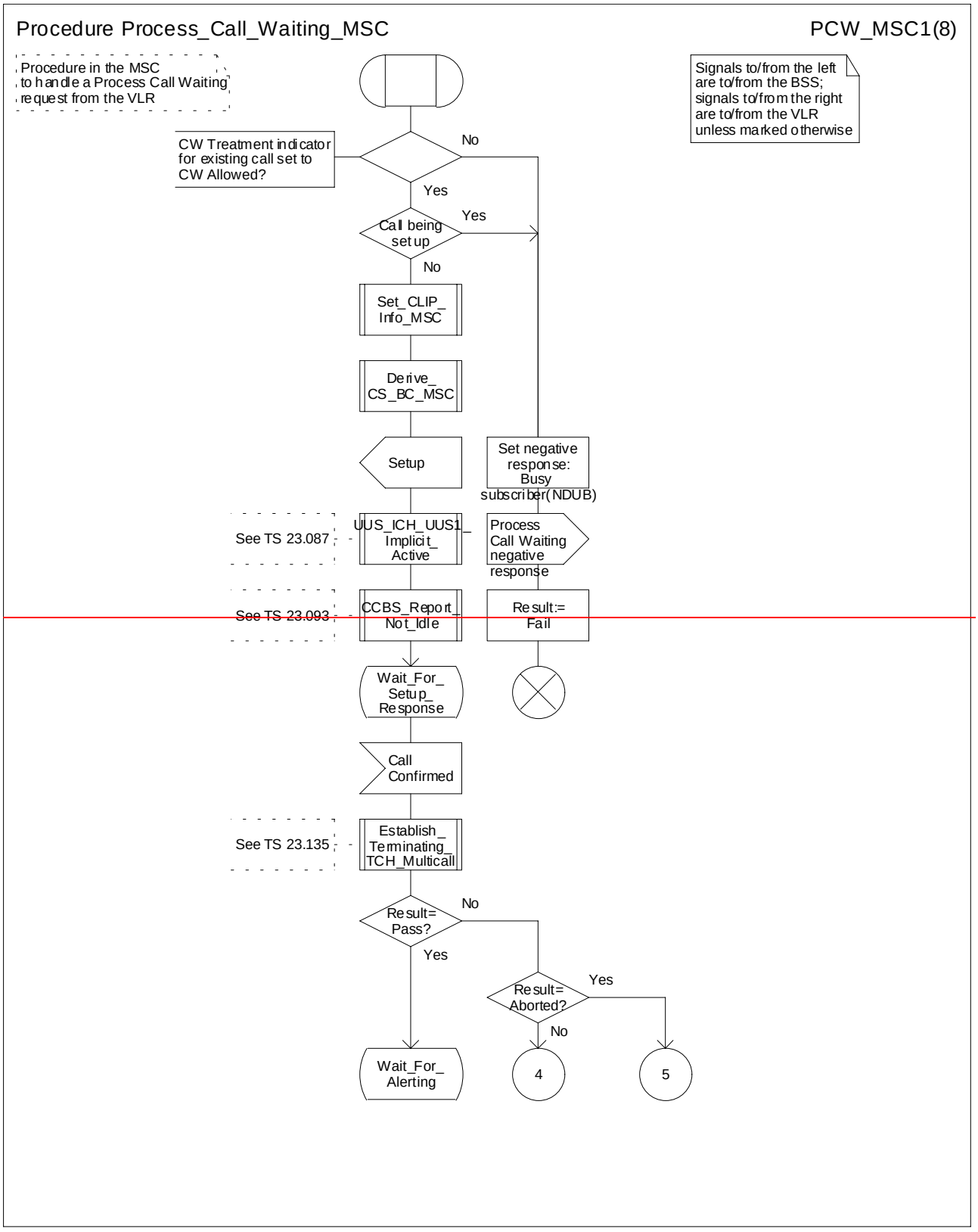
~~Sheet 8: the procedures UUS_MSC_Check_UUS2_UUI_to_MS and UUS_MSC_Check_UUS2_UUI_to_NW are specific to UUS; they are specified in 3GPP TS 23.087 [20].~~

~~Sheet 8: the procedure CD_UUS_Interaction is specific to Call Deflection; it is specified in GSM 23.0 72 [11].~~

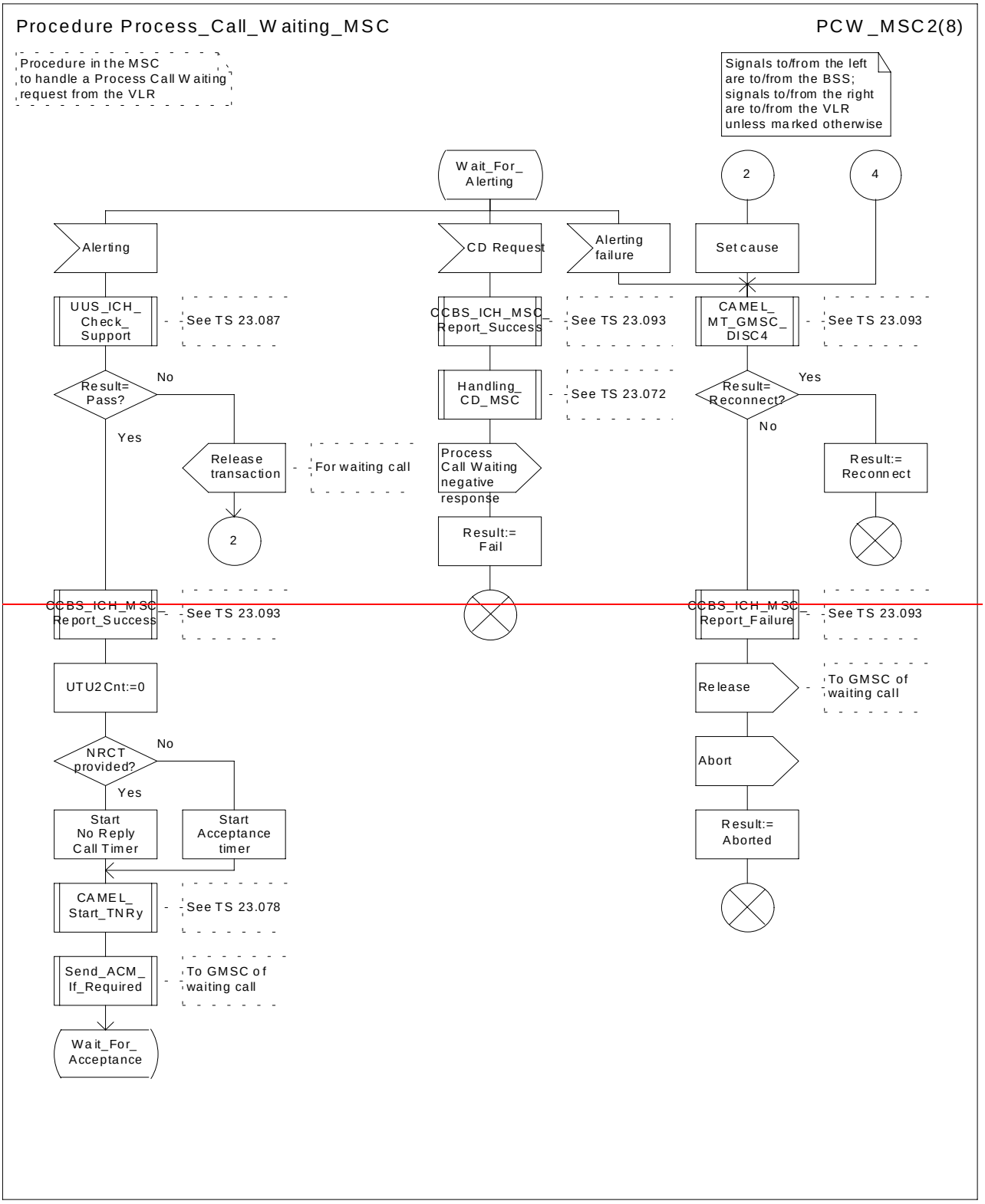
. . .


Process ICH_MSC
ICH_MSC3(15)
Process in the MSC to handle an incoming (MT) call
Wait_For_ MT_Call_ Result
Send Info For Incoming Call negative response
Complete Call
2
Process Call Waiting
CD_Reject
See TS 23.072
Complete_ Call_In_MSC
Process_ Call_ Waiting_MSC
CCBS_Set_ Diagnostic_ For_Release
See TS 23.093
Result= Pass?
Yes
No
Store CW Treatment indicator for this call if received in SII2
UUS_ICH_ Check_ Support
See TS 23.087
To Subs_FSM
Call established
Call setup failed
Set cause
Wait_For_ Clear
Cause= No Subscriber Reply?
Result= Fail
CAMEL_ MT_GMSC_ DISC4
CAMEL_ MT_GMSC_ DISC5
Wait_For_ MT_Call_ Result
Result= Reconnect?
Send Info For MT Reconnected Call
Release
Wait_For_ Reconnected_ Call_Result
Release transaction
CCBS_Check_ Last_Call
See TS 23.093
Release call resources
Idle
Signals to/from the left are to/from the GMSC; signals to/from the right are to/from the VLR unless marked otherwise

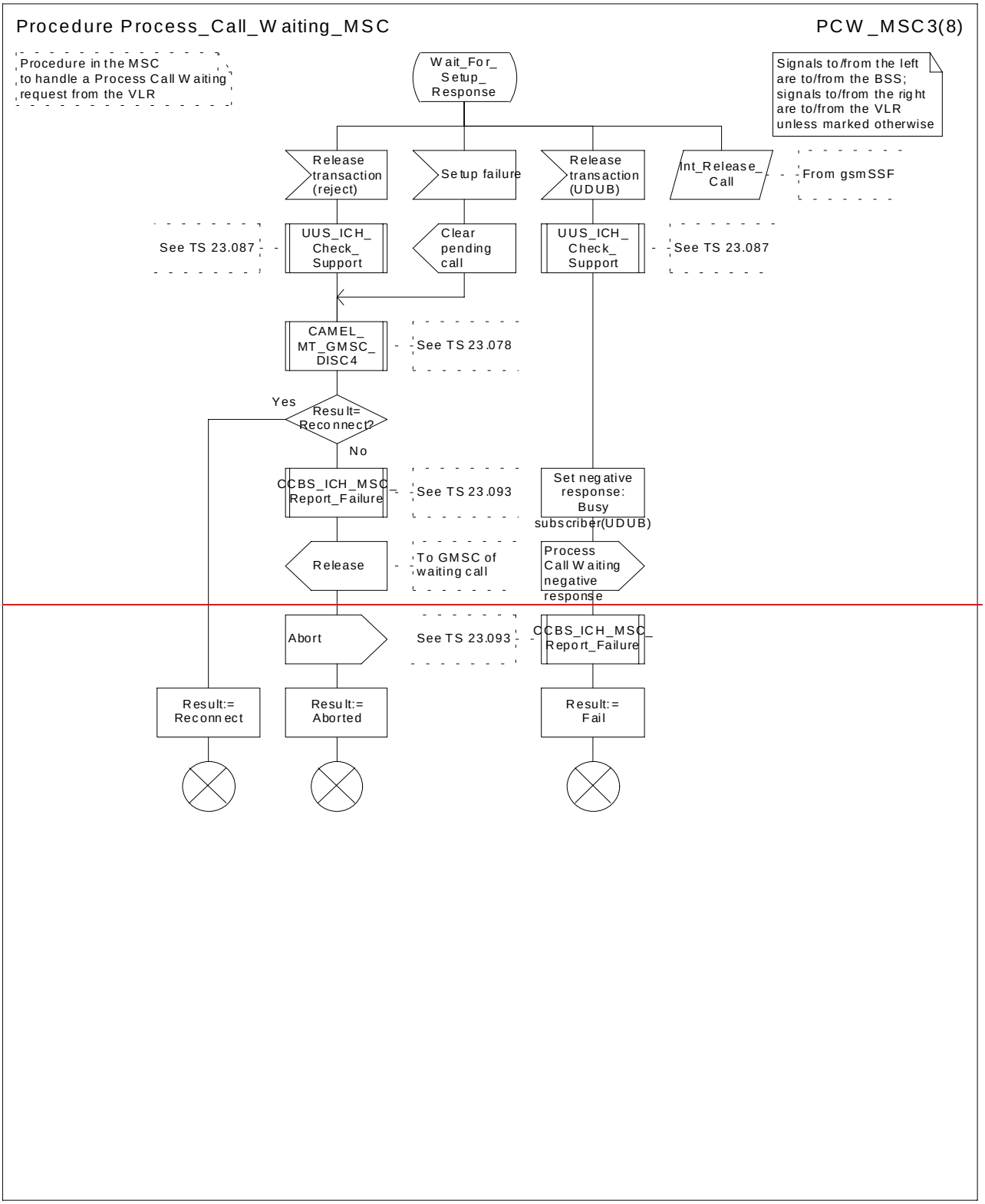

Process ICH_MSC
ICH_MSC3(15)
Process in the MSC to handle an incoming (MT) call
Wait_For_ MT_Call_ Result
Send Info For Incoming Call negative response
Complete Call
2
Process Call Waiting
CD_Reject
See TS 23.072
Complete_ Call_In_MSC
See TS 23.083
Process_ Call_ Waiting
CCBS_Set_ Diagnostic_ For_Release
See TS 23.093
Result= Pass?
Yes
No
Store CW Treatment indicator for this call if received in SII2
UUS_ICH_ Check_ Support
See TS 23.087
To Subs_FSM
Call established
Call setup failed
Set cause
Wait_For_ Clear
Cause= No Subscriber Reply?
Result= Fail
CAMEL_ MT_GMSC_ DISC4
CAMEL_ MT_GMSC_ DISC5
Wait_For_ MT_Call_ Result
Result= Reconnect?
Send Info For MT Reconnected Call
Release
Wait_For_ Reconnected_ Call_Result
Release transaction
CCBS_Check_ Last_Call
See TS 23.093
Release call resources
Idle
Signals to/from the left are to/from the GMSC; signals to/from the right are to/from the VLR unless marked otherwise



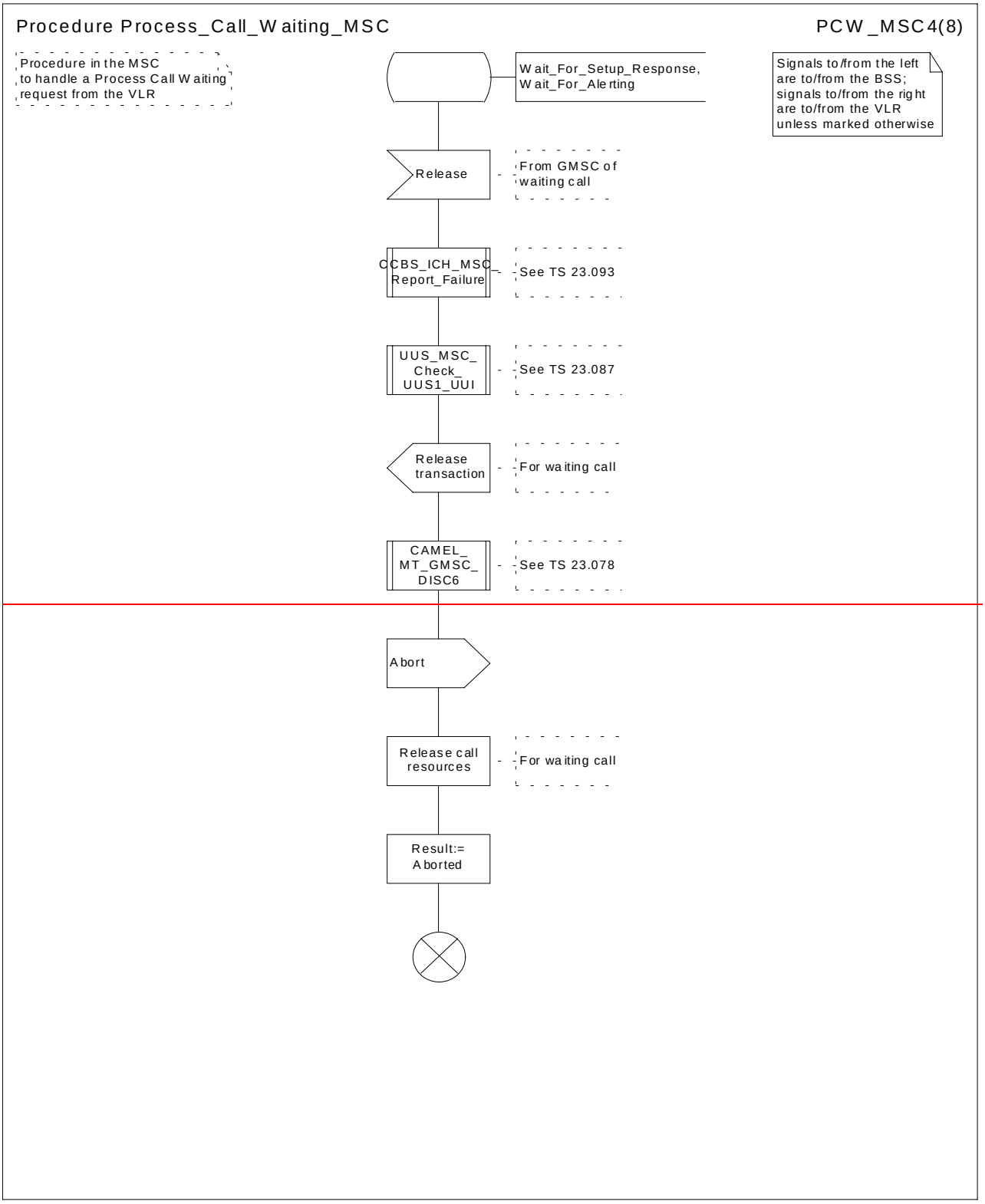
~~Figure 71a: Procedure Process_Call_Waiting_MSC (sheet 1)~~



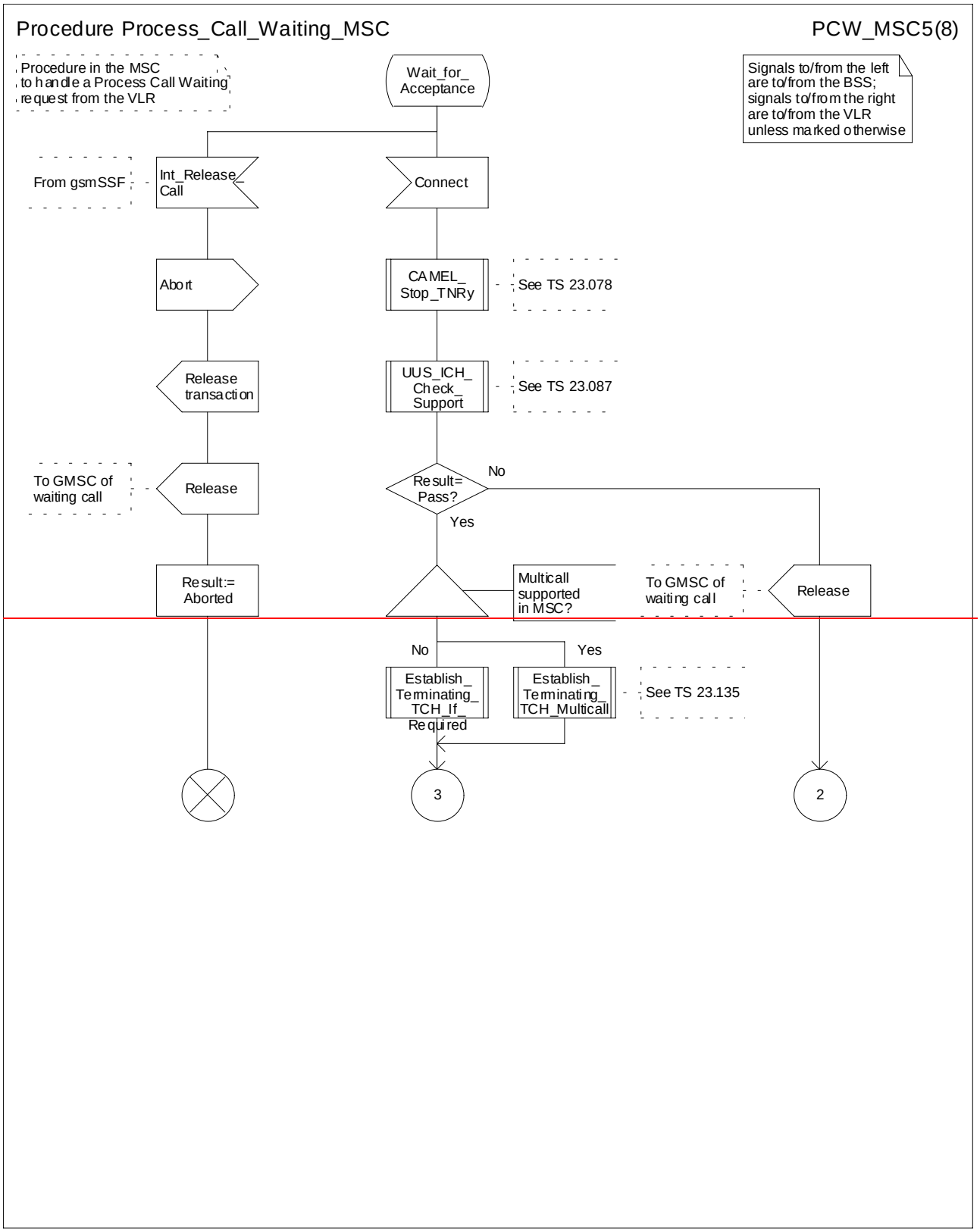
~~Figure 71b: Procedure Process_Call_Waiting_MSC (sheet 2)~~



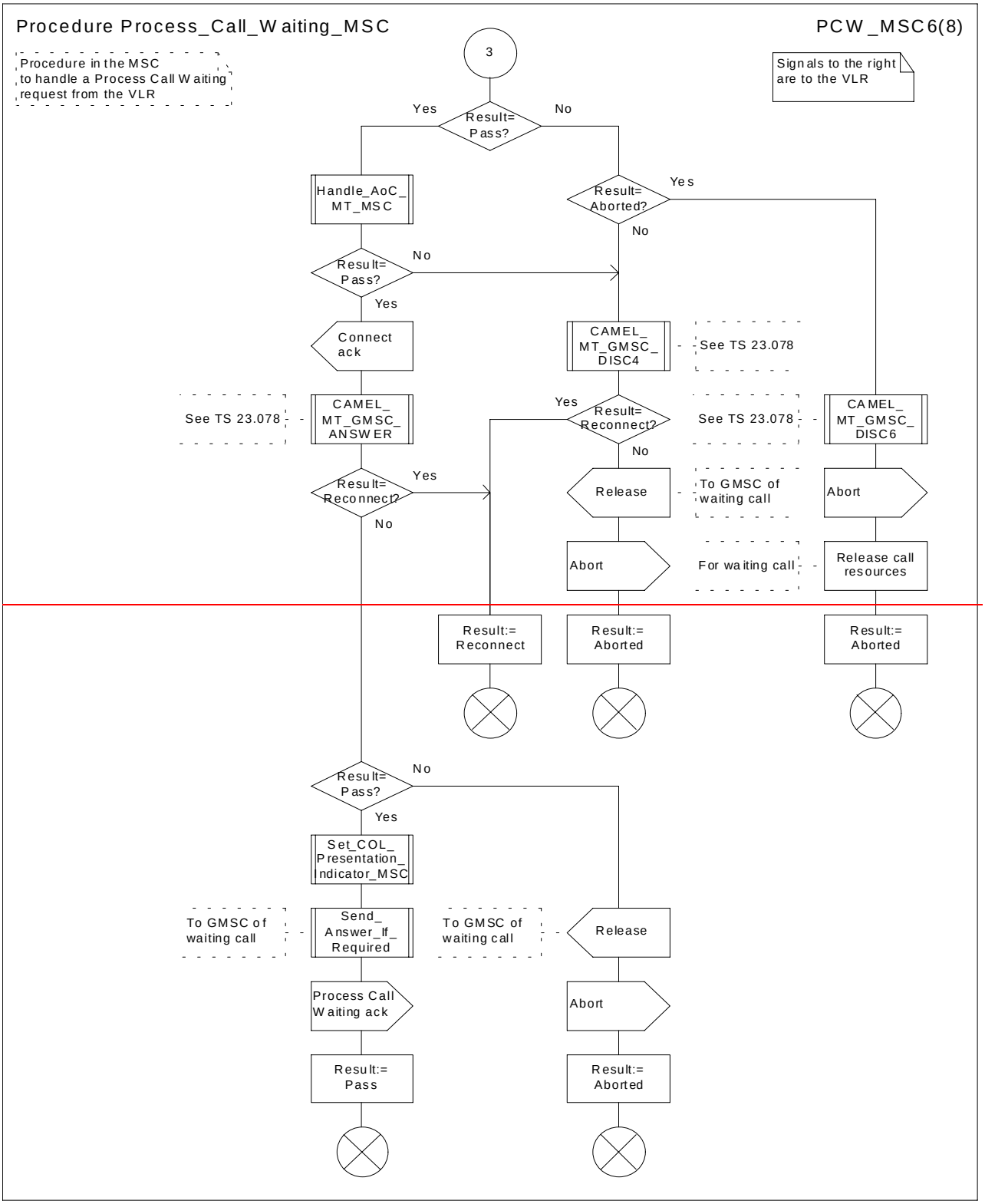
~~Figure 71c: Procedure Process_Call_Waiting_MSC(sheet 3)~~



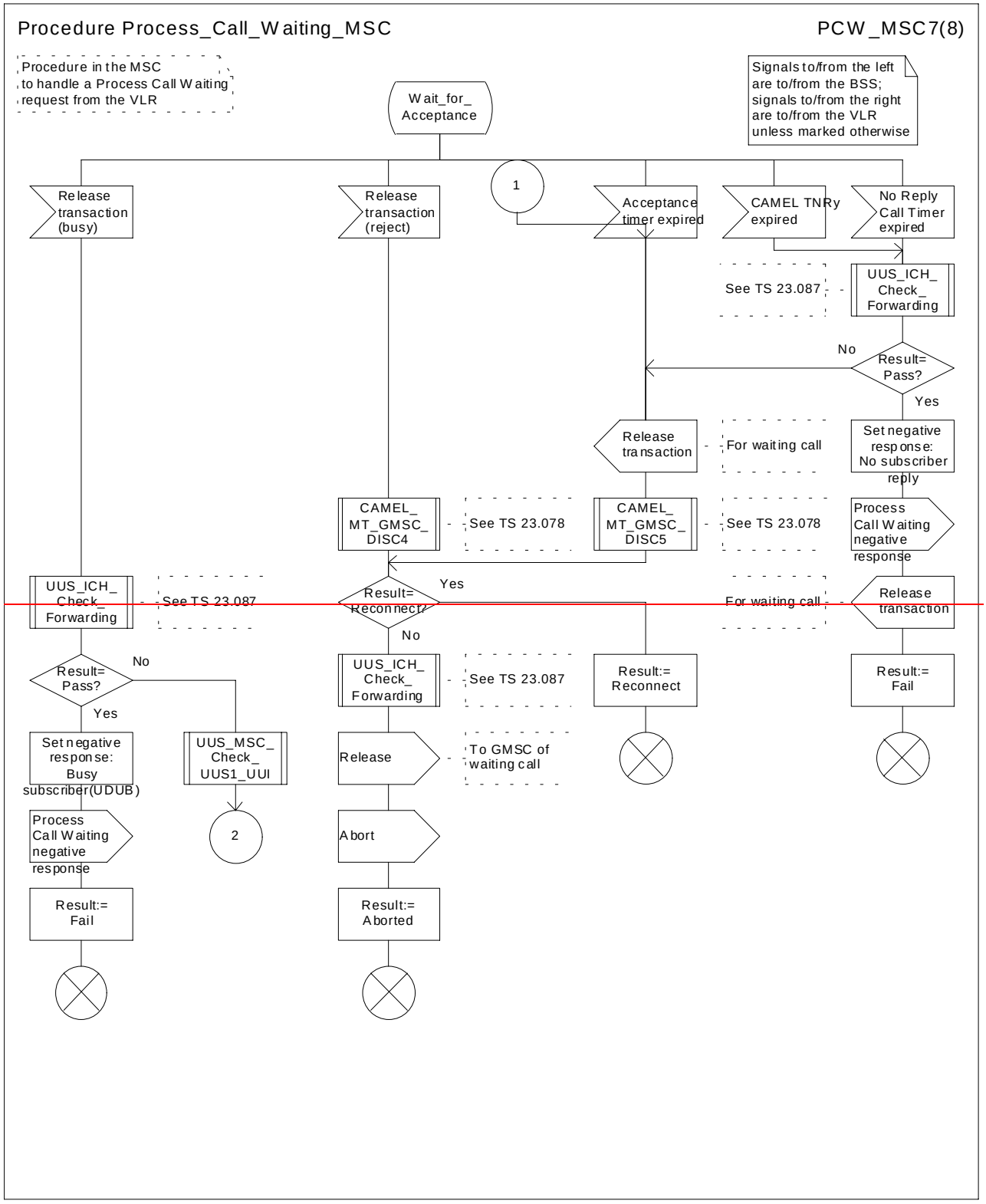
~~Figure 71d: Procedure Process_Call_Waiting_MSC(sheet 4)~~



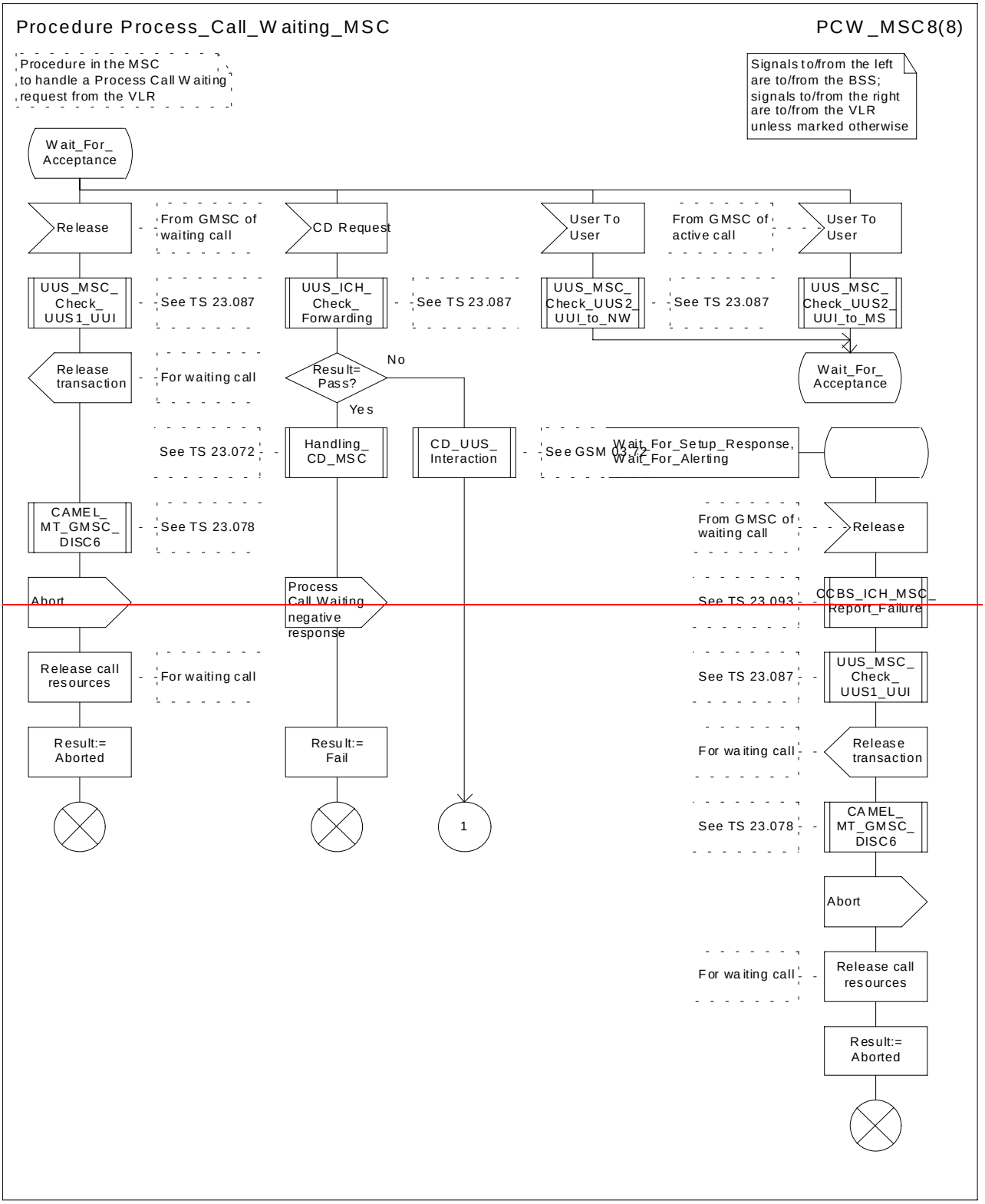
~~Figure 71e: Procedure Process_Call_Waiting_MSC(sheet 5)~~



~~Figure 71f: Procedure Process_Call_Waiting_MSC(sheet 6)~~



~~Figure 71g: Procedure Process_Call_Waiting_MSC(sheet 7)~~



~~**Figure 71h: Procedure Process_Call_Waiting_MSC(sheet 8)**~~

3GPP TSG-CN4 Meeting #06
Beijing, China, 15-19 Jan 2001

Tdoc N4-010426
(rev of *N4-010356*)

CR-Form-v3

CHANGE REQUEST

⌘ **23.083** **CR** **006** ⌘ rev **2** ⌘ Current version: **4.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Enhancement of procedures for Call Hold
Source:	⌘	CN4
Work item code:	⌘	TEI
Date:	⌘	26/02/2001
Category:	⌘	**C**
Release:	⌘	REL-4

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

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

Reason for change:	⌘	To provide better interworking with the call hold procedures and Basic Call Handling – 3G TS 23.018.
Summary of change:	⌘	Updated the MAF and the SDLs for the two procedures Process_Hold_Request and Process_Retrieve_Request as well as the explanatory text for Call Hold.
Consequences if not approved:	⌘	Will be out of alignment with 3G TS 23.018.

Clauses affected:	⌘	0.1, 0.2, 2.1		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	Linked to 23.018 (CR 065)
Other comments:	⌘	The MAF for call waiting (CW) had some editorial changes made to it in the previous revision of this CR. This change has now been moved out of this one and into the CW CR (CR 007 – Tdoc N4-010358).		

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

0.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TR 21.905: "3G Vocabulary".

[2] 3GPP TS 22.082: "Call Forwarding (CF) Supplementary Services - Stage 1".

[3] 3GPP TS 23.011: "Technical realization of supplementary services - General Aspects".

[4] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols - Stage3".

[5] 3GPP TS 23.018: “Basic call handling”.

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

0.2 Abbreviations

In addition to those below, ~~A~~abbreviations used in the present document are listed in TR 21.905.

HTI: Hold ~~Transaction~~Treatment Indicator

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

2 Call hold (HOLD)

2.1 Functions and information flows

The following Mobile Additional Function has been identified for the call hold service:

MAF024

Call hold related authorizations examination

The ability of a PLMN component to determine the authorizations relating to call hold. See figure 2.1.

Location: VLR

The ~~overall SDL diagram~~ procedures Process_Hold_Request, Process_Retrieve_Request and Handle_Timed_Call_Swap ~~of call hold is~~ are shown in figures 2.2a, 2.2b and 2.2c, respectively.

Procedure Process_Retrieve_Request: the process Subs_FSM is defined in 3GPP TS 23.018 [5].

Procedure Process_Hold_Request, procedure Process_Retrieve_Request: the variable On_Hold is set in the process OCH_MSC or the process ICH_MSC.

Procedure Handle_Timed_Call_Swap: the macro Decrement_Call_Counter is defined in 3GPP TS 23.018 [5].

All procedures: to avoid having two calls on hold at the same time (except as a transient effect during the handling of retrieve), the reception of the retrieve request is supervised by a retrieve timer T (T = 5 s).

All procedures: the network may receive hold and retrieve requests not included in this overall SDL. These requests will be rejected by the network.

All procedures: the handling of requests other than hold and retrieve requests is defined in the appropriate supplementary service specification.

The information flows are shown in figure 2.3. In these flows it is assumed that the served user is a mobile user and that other users are fixed network users.

~~Description of overall SDL diagram for call hold~~

~~In the SDL diagrams the states are dimensioned in two dimensions. The first dimension is a normal basic call state e.g. null or active. The second dimension is an auxiliary state associated with hold.~~

~~Three auxiliary states are used:~~

~~i) idle;~~

~~ii) hold request (abbreviated hold req);~~

~~– a request has been made for the hold function~~

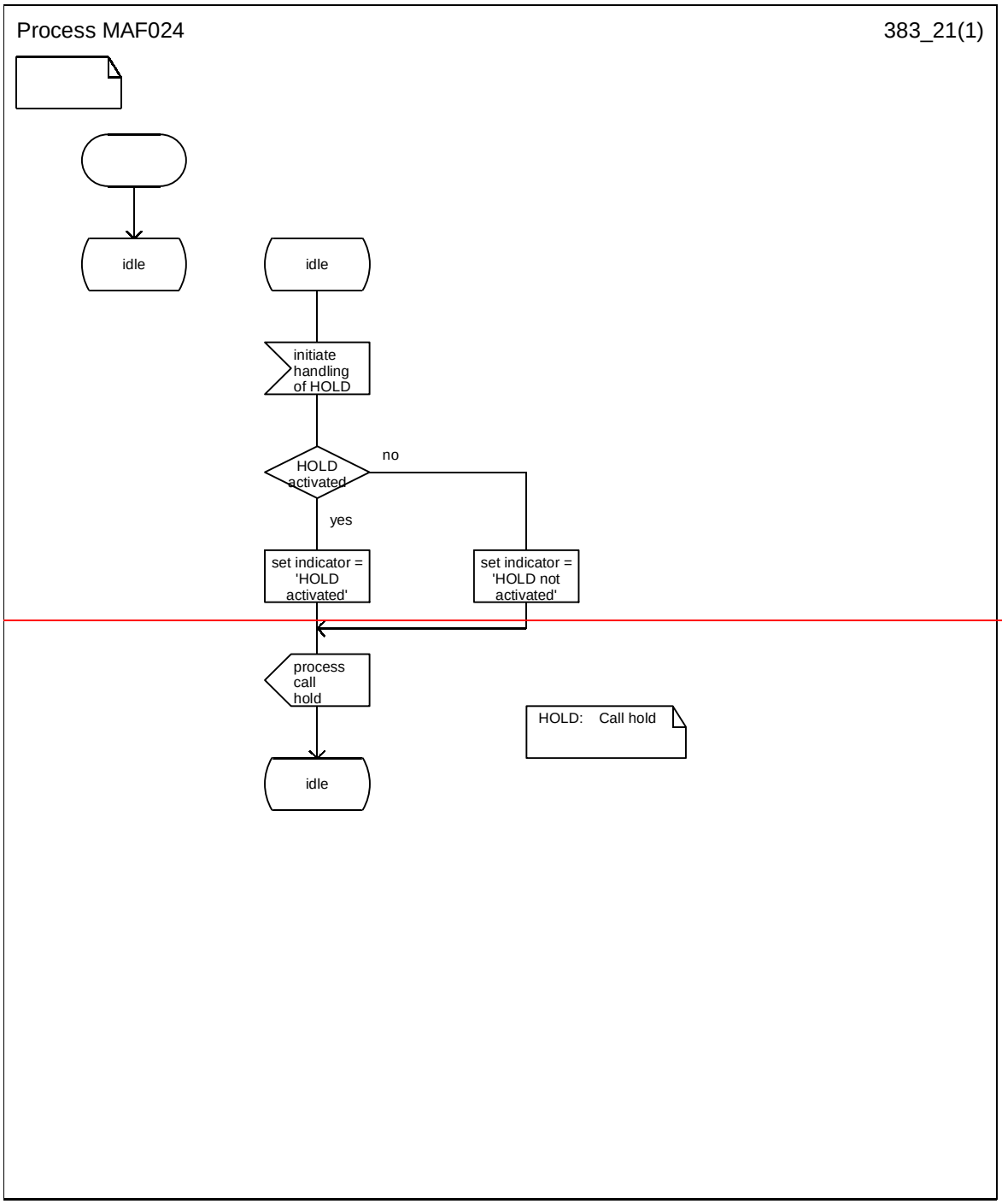
~~iii)call held (abbreviated held);~~

~~– the call is held.~~

~~Several two-dimensional states in connection with hold are possible e.g. (active, idle), (active, held) or (null, idle).~~

~~When the served user wants to shuttle between an (active, idle) call and an (active, held) call, this is achieved by a hold request for the first call immediately followed by a retrieve request for the second. To avoid having two calls on hold at the same time, the reception of the retrieve request is supervised by a timer T (T = 5 s).~~

~~The network may receive hold and retrieve requests not included in this overall SDL. These requests will be rejected by the network. For handling requests other then hold and retrieve requests look at descriptions of the other GSM supplementary services.~~


Process MAF024
383_21(1)
idle
idle
initiate handling of HOLD
HOLD activated
no
yes
set indicator = 'HOLD activated'
set indicator = 'HOLD not activated'
process call hold
idle
HOLD: Call hold

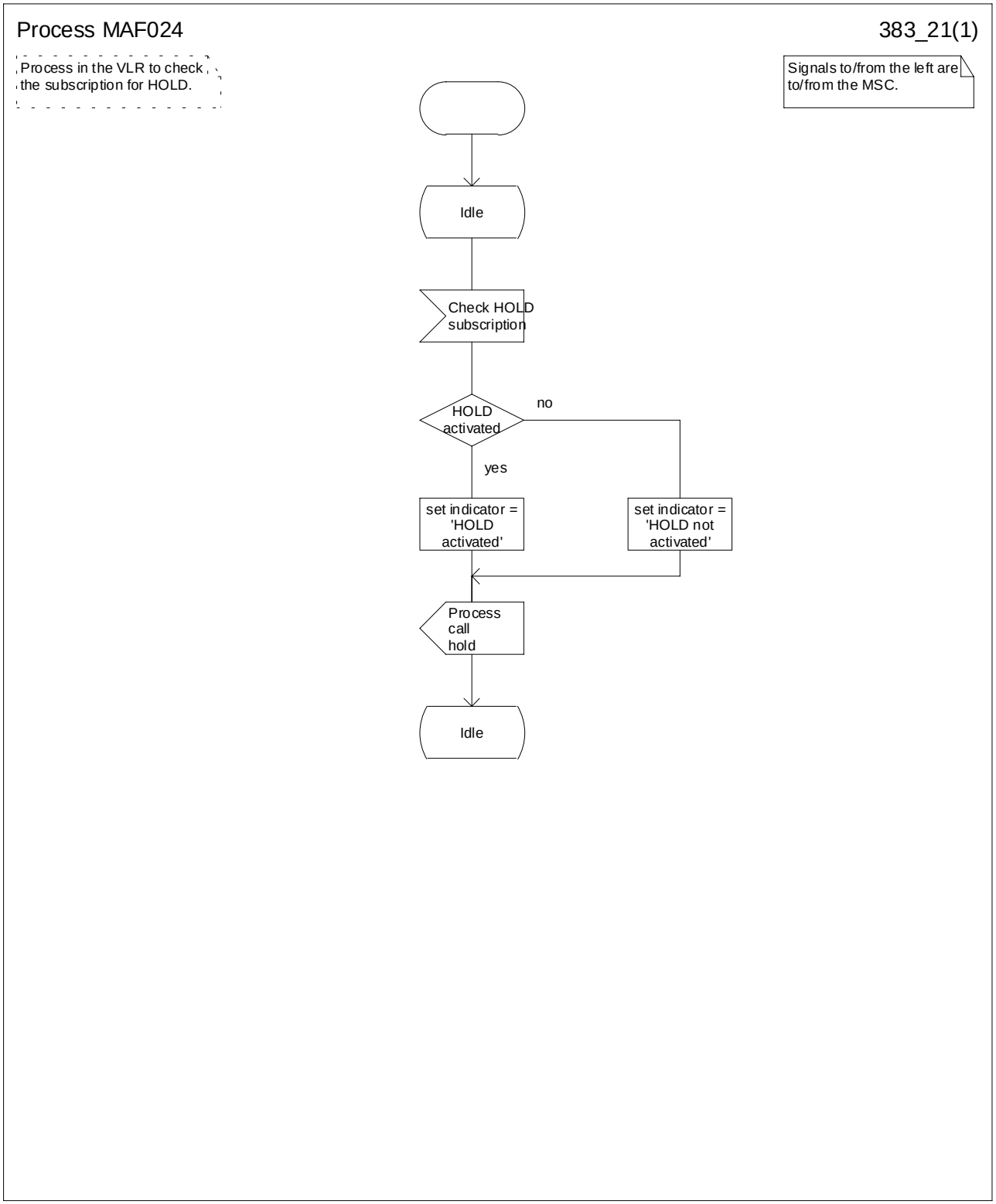
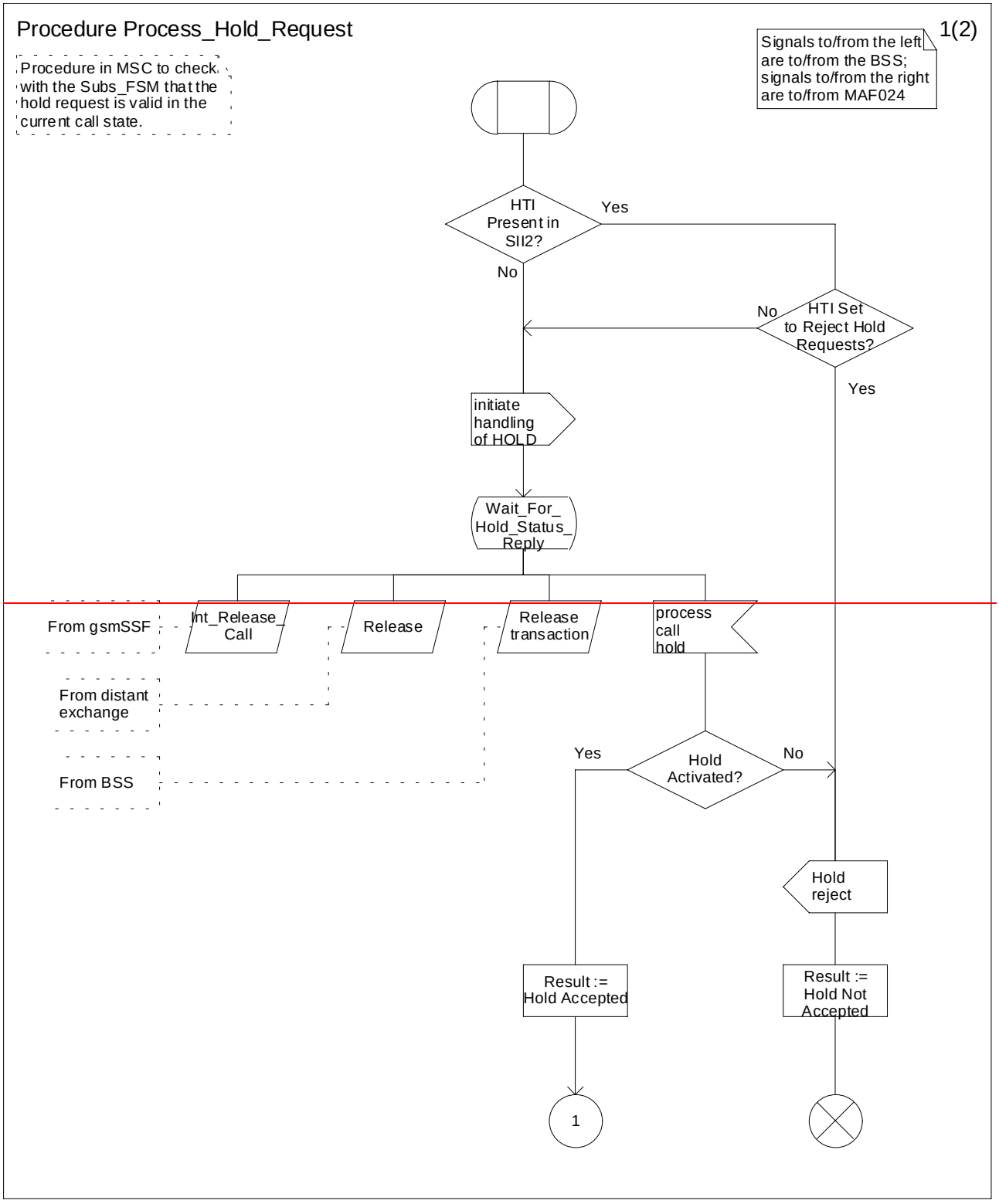


Figure 2.1: MAF024 Call hold related authorisations examination (VLR)


Procedure Process_Hold_Request
1(2)
Procedure in MSC to check with the Subs_FSM that the hold request is valid in the current call state.
Signals to/from the left are to/from the BSS; signals to/from the right are to/from MAF024
HTI Present in SII2?
Yes
No
No
HTI Set to Reject Hold Requests?
Yes
initiate handling of HOLD
Wait_For_ Hold_Status_ Reply
From gsmSSF
Int_Release_ Call
Release
Release transaction
process call hold
From distant exchange
From BSS
Yes
Hold Activated?
No
Hold reject
Result := Hold Accepted
Result := Hold Not Accepted
1

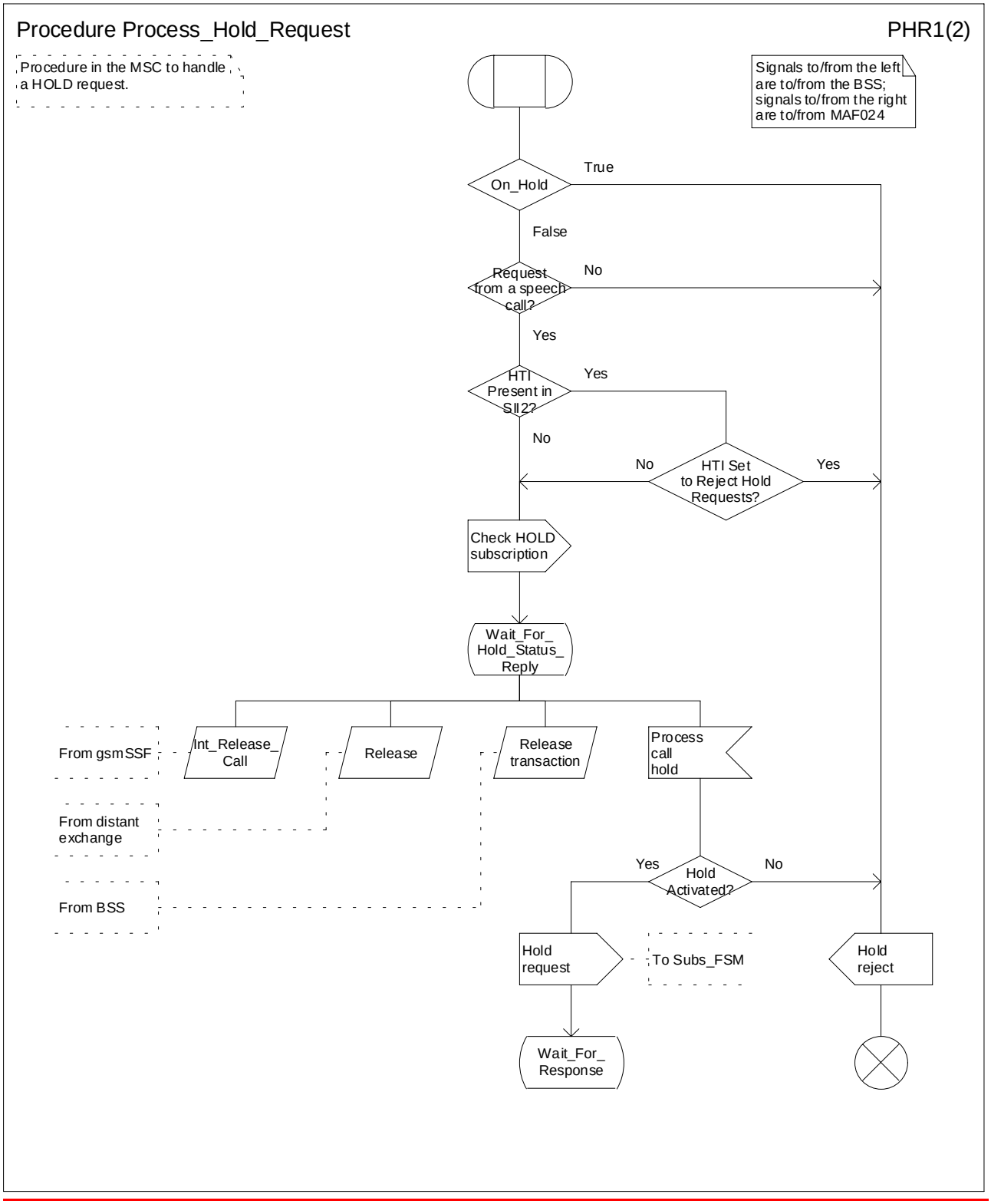
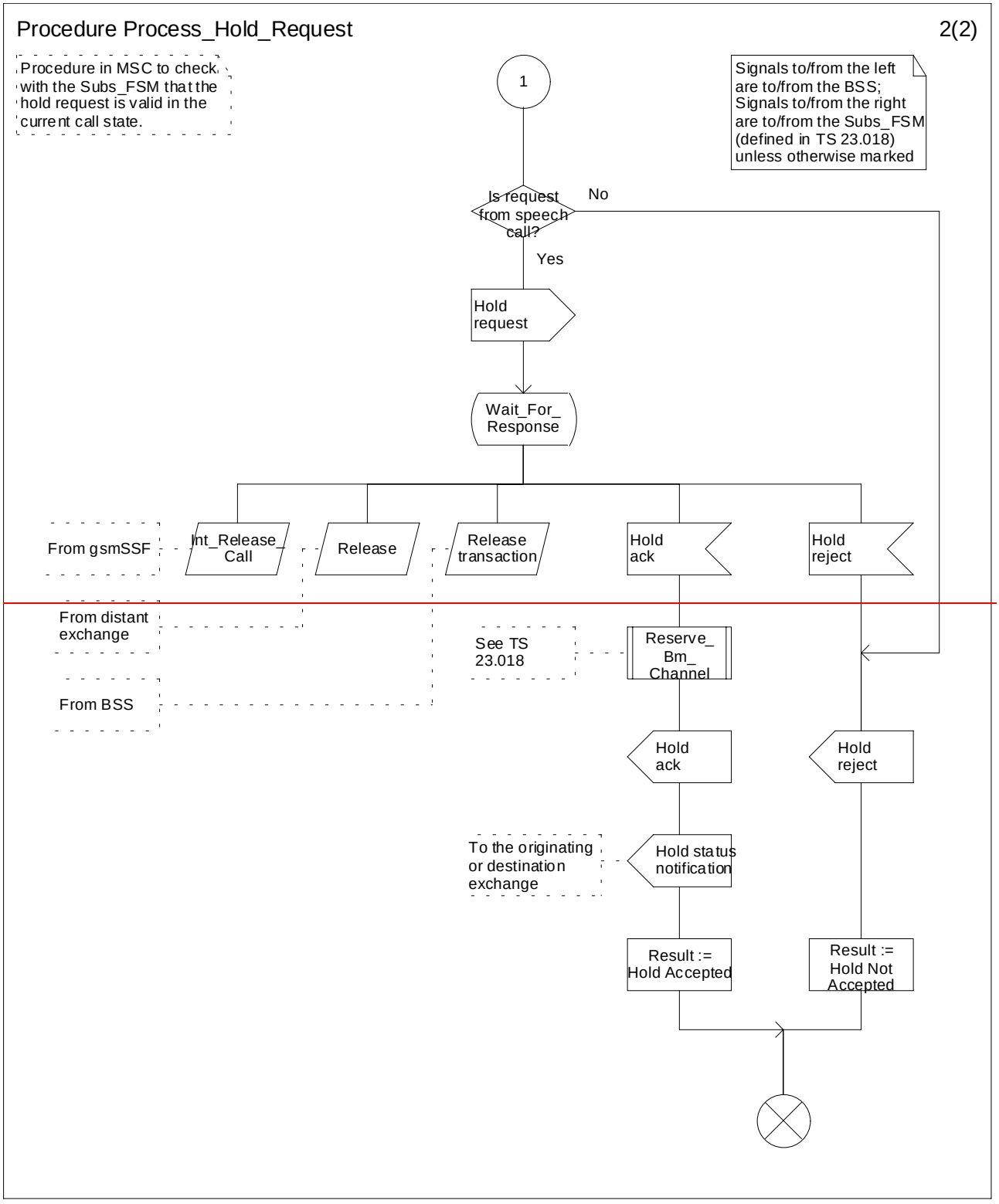


Figure 2.2a (sheet 1 of 2): Procedure Process_Hold_Request


Procedure Process_Hold_Request
2(2)
Procedure in MSC to check with the Subs_FSM that the hold request is valid in the current call state.
1
Signals to/from the left are to/from the BSS; Signals to/from the right are to/from the Subs_FSM (defined in TS 23.018) unless otherwise marked
Is request from speech call?
No
Yes
Hold request
Wait_For_ Response
From gsmSSF
Int_Release_ Call
Release
Release transaction
Hold ack
Hold reject
From distant exchange
From BSS
See TS 23.018
Reserve_ Bm_ Channel
Hold ack
Hold reject
To the originating or destination exchange
Hold status notification
Result := Hold Accepted
Result := Hold Not Accepted

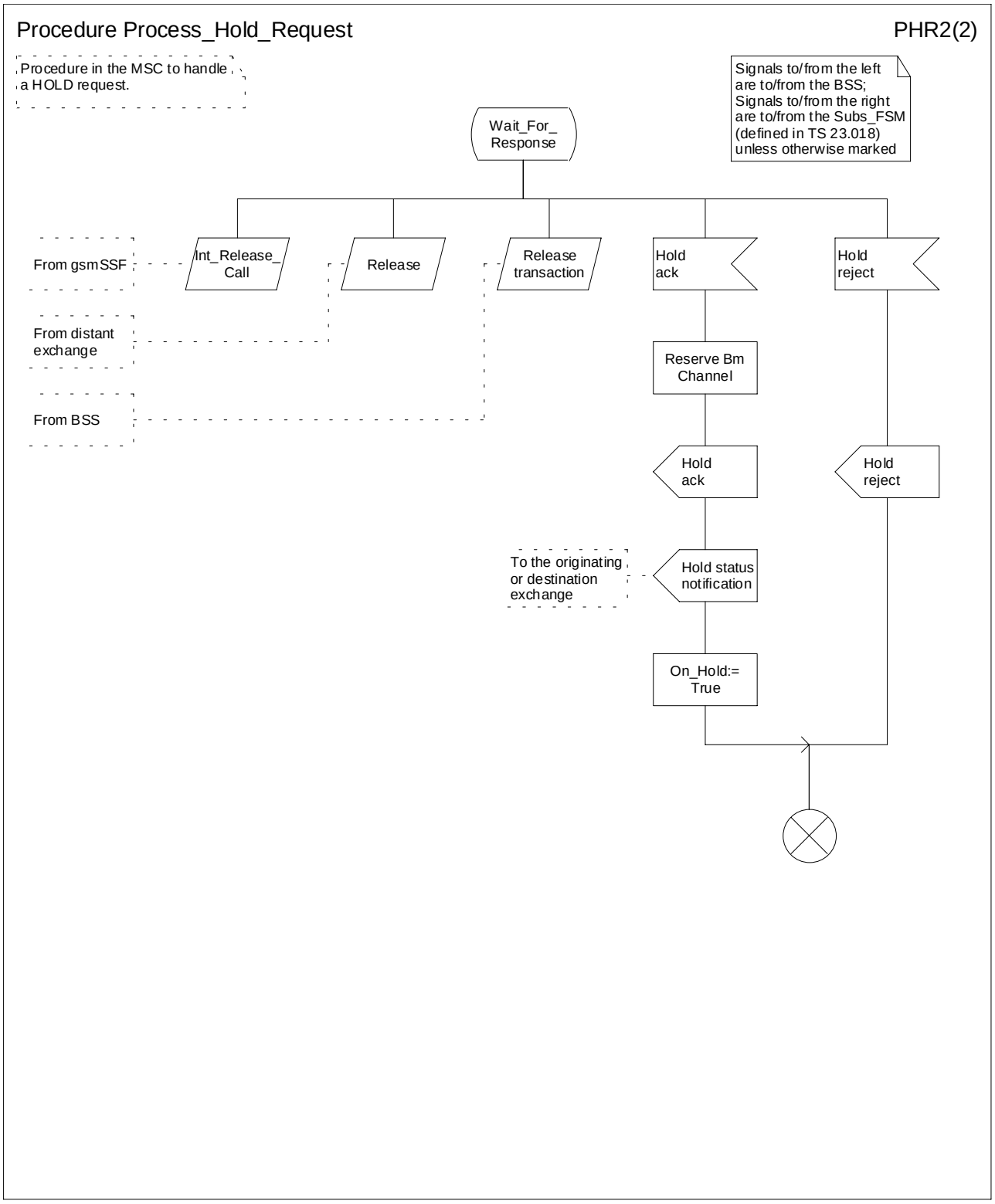
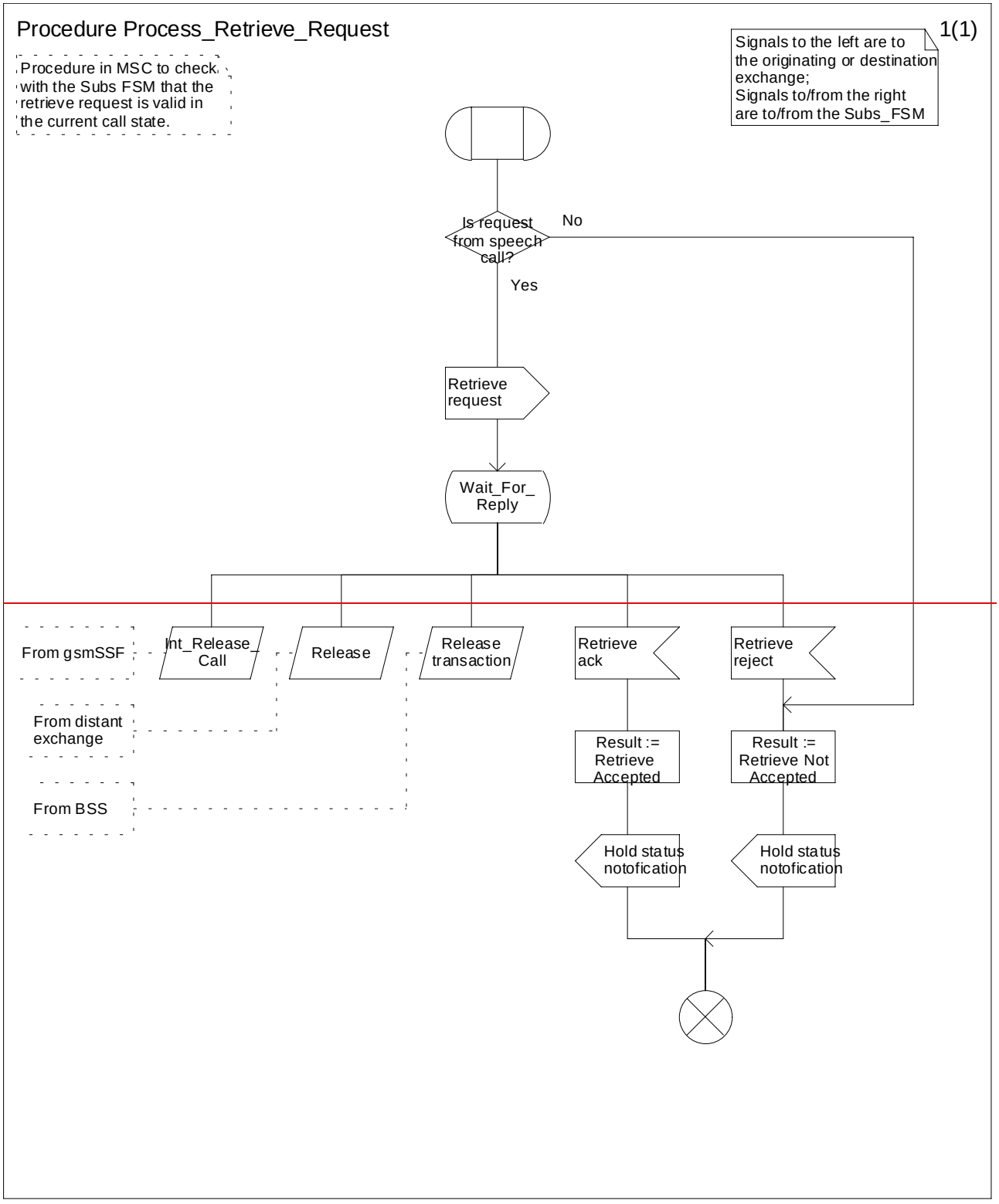


Figure 2.2a (sheet 2 of 2): Procedure Process_Hold_Request


Procedure Process_Retrieve_Request
1(1)
Procedure in MSC to check with the Subs FSM that the retrieve request is valid in the current call state.
Signals to the left are to the originating or destination exchange;
Signals to/from the right are to/from the Subs_FSM
Is request from speech call?
No
Yes
Retrieve request
Wait_For_ Reply
From gsmSSF
From distant exchange
From BSS
Int_Release_ Call
Release
Release transaction
Retrieve ack
Retrieve reject
Result := Retrieve Accepted
Result := Retrieve Not Accepted
Hold status notofication
Hold status notofication

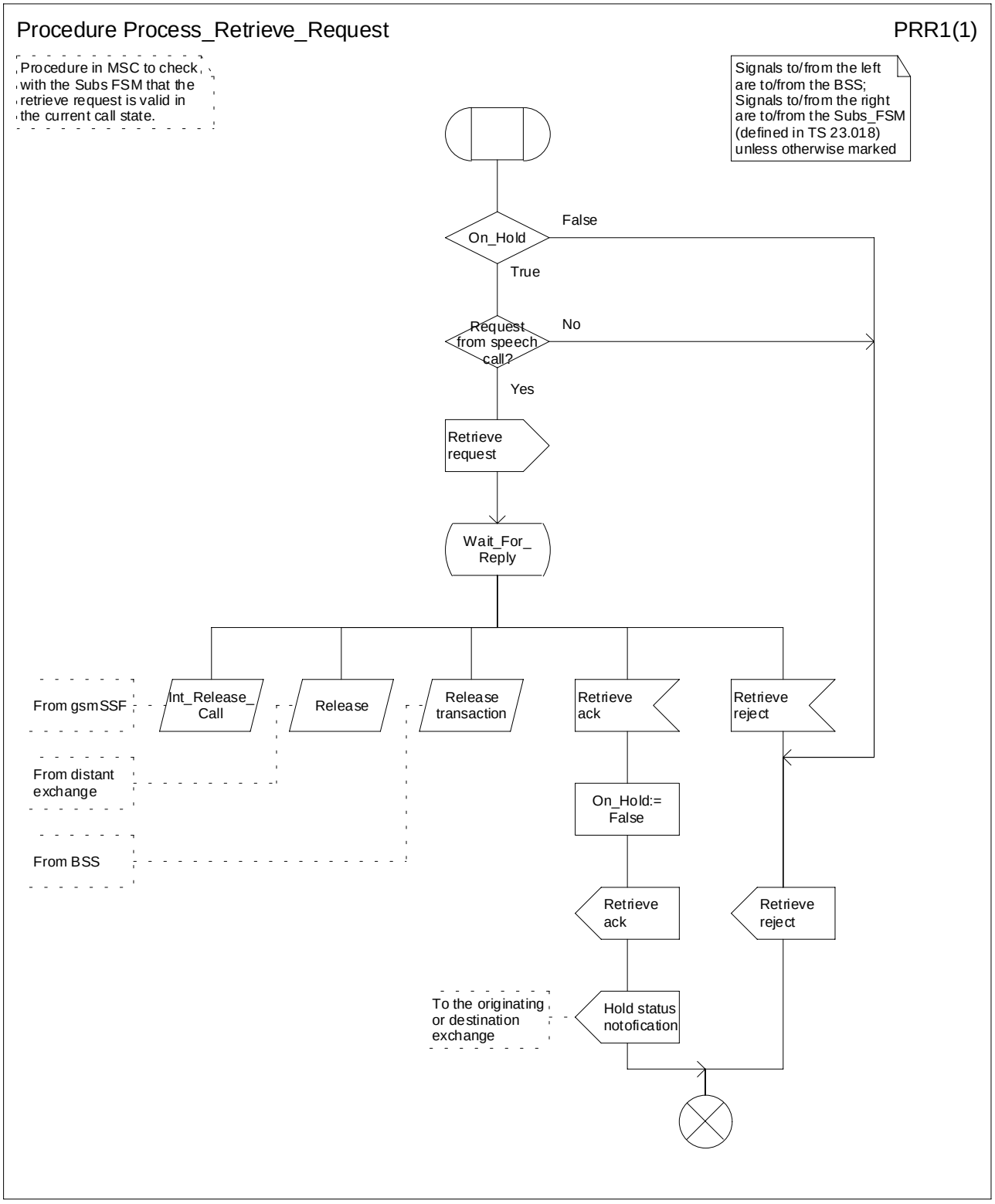


Figure 2.2b: Procedure Process_Retrieve_Request

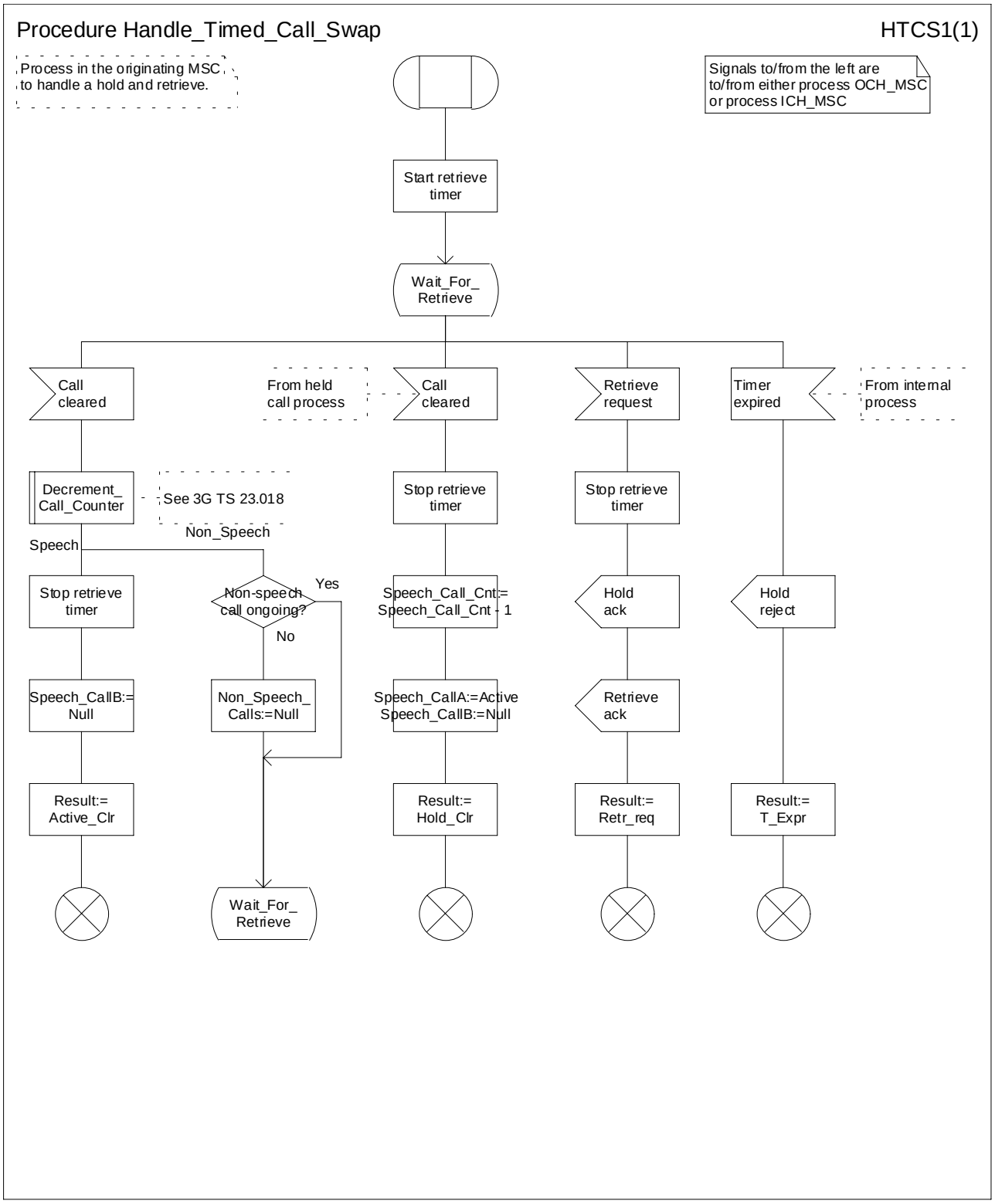


Figure 2.2c: Procedure Handle_Timed_Call_Swap

3GPP TSG-CN4 Meeting #07
Sophia Antipolis, France, 26/2-2/3/01

Tdoc N4-010358

CR-Form-v3

CHANGE REQUEST

⌘ **23.083** **CR** **007** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Enhancement of CW procedures
Source:	⌘	CN4
Work item code:	⌘	TEI
Date:	⌘	20/02/01
Category:	⌘	**C**
Release:	⌘	REL-4

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

Use one of the following releases:

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

Reason for change:	⌘	To provide better interworking with Basic Call Handling – 3G TS 23.018.
Summary of change:	⌘	Removal of old, out of date CW SDLs and insertion of the Process_Call_Waiting_MSC procedure (which has been renamed to just Process_Call_Waiting) from 23.018. The references section has been updated to reflect the new documents referred to by this procedure.
Consequences if not approved:	⌘	

Clauses affected:	⌘	0.1, 1.2		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	Linked to 23.018 (CR 067)
Other comments:	⌘			

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

0.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TR 21.905: "3G Vocabulary".

[2] 3GPP TS 22.082: "Call Forwarding (CF) Supplementary Services - Stage 1".

[3] 3GPP TS 23.011: "Technical realization of supplementary services - General Aspects".

[4] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols - Stage3".

[5] 3GPP TS 23.018: "Basic call handling".

[6] 3GPP TS 23.078: "Customized Applications for Mobile network Enhanced Logic (CAMEL) - Phase 3; Stage 2".

[7] 3GPP TS 23.135: "Multicall supplementary service; Technical Realisation; Stage 2".

[8] 3GPP TS 23.087: "User –to-User Signalling (UUS) - Stage 2".

[9] 3GPP TS 23.093: "Technical realisation of Completion of Calls to Busy Subscriber (CCBS) - Stage 2".

[10] 3GPP TS 23.072: "Call Deflection (CD) supplementary service - Stage2".

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

1 Call waiting (CW)

. . .

1.2 Functions and information flows

TS 24.008 specifies the procedures for call control. These shall also be used for waiting calls when applicable.

The following Mobile Additional Function has been identified for the call waiting service:

MAF013

Call waiting related authorizations examination

The ability of a PLMN component to determine the authorizations relating to call waiting. See figure 1.4.

Location: VLR

~~Definitions:~~

~~Subscriber B:~~

~~The subscriber who is provided by the network with the call waiting supplementary service. The subscriber B is always a mobile subscriber.~~

~~User B:~~

~~The user who reacts to call waiting at subscriber B. The user B is always a mobile user.~~

~~User C:~~

~~The user who has originated a call to subscriber B which causes the call waiting supplementary service to be invoked. The user C may be a mobile user.~~

~~User A:~~

~~The user who is engaged in a call with user B. The user A may be a mobile user.~~

~~Timer T1:~~

~~This timer corresponds to T303 + T310 (as defined in TS 24.008).~~

~~Timer T2:~~

~~Call Waiting Timer. This shall limit the duration of the call in the waiting condition.~~

~~Timer T3:~~

~~No Reply Condition Timer (see TS 22.082).~~

~~CFNRc:~~

~~Call Forwarding on Not Reachable (see TS 22.082).~~

~~CFNRy:~~

~~Call Forwarding on No Reply (see TS 22.082).~~

~~CW:~~

~~Call Waiting.~~

The ~~overall SDL diagram of~~ procedure Process_~~c~~Call-_~~w~~Waiting is shown in figure 1.5. ~~This represents the network as a whole.~~

Sheet 1: the procedure Set_CLIP_Info_MSC is specific to CLIP; it is specified in 3GPP TS 23.018 [5].

Sheet 1: the procedure Derive_CS_BC_MSC is specified in 3GPP TS 23.018 [5].

Sheet 1: the VMSC and the MS may negotiate the bearer capability to be used for the call by the exchange of information in the Set-up and Call Confirmed messages.

Sheet 1: the Call Confirmed message indicates "busy" for the successful case.

Sheet 1: the procedure Establish_Terminating_TCH_Multicall1 is specific to Multicall; it is specified in 3GPP TS 23.135 [7]. If the VMSC does not support Multicall, processing continues from the “Yes” exit of the test “Result=Pass?”.

Sheet 1: the procedure UUS_ICH_UUS1_Implicit_Active is specific to UUS; it is specified in 3GPP TS 23.087 [8].

Sheet 1: the procedure CCBS_Report_Not_Idle is specific to CCBS; it is specified in 3GPP TS 23.093 [9].

Sheet 2, sheet 3, sheet 5: the procedure UUS_ICH_Check_Support is specific to UUS; it is specified in 3GPP TS 23.087 [8]. If the VMSC does not support UUS, processing continues from the "Yes" exit of the test "Result=Pass?" where the test follows the procedure call.

Sheet 2: the procedure CCBS_ICH_MSC_Report_Success is specific to CCBS; it is specified in 3GPP TS 23.093 [9].

Sheet 2: the task "UTU2Cnt:=0" is executed only if the VMSC supports UUS.

Sheet 2: the procedure CAMEL_Start_TNRy is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [6].

Sheet 2: the procedure Send_ACM_If_Required is specified in 3GPP TS 23.018 [5].

Sheet 2, sheet 8: the processing in the branch starting with the input "CD Request" is specific to Call Deflection; if the VMSC does not support Call Deflection the input is discarded.

Sheet 2, sheet 8: the procedure Handling_CD_MSC is specific to Call Deflection; it is specified in 3GPP TS 23.072 [10].

Sheet 2, sheet 3, sheet 6, sheet 7: the procedure CAMEL_MT_GMSC_DISC4 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [6]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 2, sheet 3, sheet 4, sheet 8: the procedure CCBS_ICH_MSC_Report_Failure is specific to CCBS; it is specified in 3GPP TS 23.093 [9].

Sheet 3, sheet 7: the Release transaction (reject) message covers all unsuccessful cases not otherwise indicated.

Sheet 4, sheet 7: the procedure UUS_MSC_Check_UUS1_UUI is specific to UUS; it is specified in 3GPP TS 23.087 [8].

Sheet 4, sheet 8: the procedure CAMEL_MT_GMSC_DISC6 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [6].

Sheet 5: the procedure CAMEL_Stop_TNRy is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [6].

Sheet 5: the procedure Establish_Terminating_TCH_If_Required is specified in 3GPP TS 23.018 [5].

Sheet 5: the procedure Establish_Terminating_TCH_Multicall is specific to Multicall; it is specified in 3GPP TS 23.135 [7].

Sheet 6: the procedure Handle_AoC_MT_MSC is specific to AoC; it is specified in 3GPP TS 23.018 [5]. If the VMSC does not support AoC, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 6: the procedure CAMEL_MT_GMSC_ANSWER is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [6]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "Yes" exit of the test "Result=Pass?" on sheet 6.

Sheet 6: the procedure Set_COL_Presentation_Indicator_MSC is specific to COLP; it is specified in 3GPP TS 23.018 [5].

Sheet 6: the procedure Send_Answer_If_Required is specified in 3GPP TS 23.018 [5]

Sheet 7: the input signal "CAMEL TNRy expired" will be received only if the VMSC supports CAMEL phase 3 or later.

Sheet 7: the procedure CAMEL_MT_GMSC_DISC5 is called if the VMSC supports CAMEL phase 3 or later; it is specified in 3GPP TS 23.078 [6]. If the VMSC does not support CAMEL phase 3 or later, processing continues from the "No" exit of the test "Result=Reconnect?".

Sheet 7, sheet 8: the procedure UUS_ICH_Check_Forwarding is specific to UUS; it is specified in 3GPP TS 23.087 [8]. If the VMSC does not support UUS, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 7, sheet 8, sheet 9: the procedure UUS_MSC_Check_UUS1_UUI is specificto UUS; it is specified in 3GPP TS 23.087 [8].

Sheet 8: the procedures UUS_MSC_Check_UUS2_UUI_to_MS and UUS_MSC_Check_UUS2_UUI_to_NW are specific to UUS; they are specified in 3GPP TS 23.087 [8].

Sheet 8: the procedure CD_UUS_Interaction is specific to Call Deflection; it is specified in GSM 23.072 [10].

Sheet 9: the procedure CCBS_ICH_MSC_Report_Failure is specific to CCBS; it is specified in 23.093 [9].

Sheet 9: the procedure CAMEL_MT_GMSC_DISC6 is specific to CAMEL; it is specified in 23.078 [6].

The information flows are shown in figure 1.6. In these flows it is assumed that user A and user C are fixed users and that user B is a mobile user. Functions to be performed by the fixed ISDN are not shown in the information flows. Only the functions to be performed by the PLMN are shown.

1.2.1 Description of overall SDL-diagram of call waiting

In the SDL-diagrams the states are dimensioned in two dimensions. The first dimension is a normal basic call state, e.g. null or active. The second dimension is an auxiliary state associated with hold, e.g. idle or held. Active call is represented by (active, idle) state, held call by (active, held) state.

When call waiting is active and the subscriber is connected to at least one call (active or held), the arrival of a subsequent incoming call from user C to user B shall, if no other call is waiting, be signalled to the mobile equipment at B as described in TS 24.008. The network shall then await an acknowledgement from the mobile termination at user B within a specific time period T1. In figure 1.5, the mobile terminated call from user C is described as being in the "Pending Ack" state during this period. The call waiting service is suspended for further incoming calls.

1.2.1.1 Behaviour during the "Pending Ack" state

Expiry of call control timers in T1

If no acknowledgement is received by the network from the mobile termination at user B within the time period T1 (timer T1 expires) then the network shall initiate clearing towards the calling user C and served user B in accordance with TS 24.008. Following the expiry of call control timers in T1 the call waiting service shall be resumed for further incoming calls.

Release of active call

User A or B may release the active call between them in the normal manner. This does not change the state of the call from user C. Note that the MS has to indicate a normal ringing tone to the served subscriber.

Release of call by user C

User C may release the call to user B. In this case, call clearing shall take place in the normal manner, and the call waiting service shall be resumed for further incoming calls.

Call hold service

User B can operate the call hold service on any active calls in the normal manner.

Indication of UDUB

User B may release the call from user C using the indication of UDUB. In this case, if CFB is active the call from user C shall be forwarded, if CFB is not active the call from user C shall be cleared. The call waiting service is resumed for further incoming calls.

Rejection of call from user C

User B may reject the call from user C. In this case, the call from user C shall be cleared. The call waiting service is resumed for further incoming calls.

Acknowledgement of call from user C

If the mobile termination at user B acknowledges the incoming call within the time period T1, a call is waiting indication shall be sent towards calling user C. Timer T1 is stopped. Upon reception of alerting the network shall await an acceptance from the controlling user B within the time period T2. In figure 1.5, the mobile terminated call is described as being in the "Waiting" state during this period. In case the controlling subscriber B has call forwarding on no reply active the network shall await an acceptance from user B within the time period T3 < T2. The call waiting service is still suspended for further incoming calls.

1.2.1.2 Behaviour during the "Waiting" State

Expiry of Timer T3

If no acceptance is received by the network within the time period T3 (timer T3 expires) the waiting call shall be forwarded on no reply and clearing shall be initiated towards the controlling user B. The call waiting service is resumed for further incoming calls.

Expiry of Timer T2

If call forwarding on no reply is not active and no acceptance is received within the time period T2 (timer T2 expires), the waiting call shall be cleared by the network towards the controlling user B and the calling user C. The call waiting service is resumed for further incoming calls.

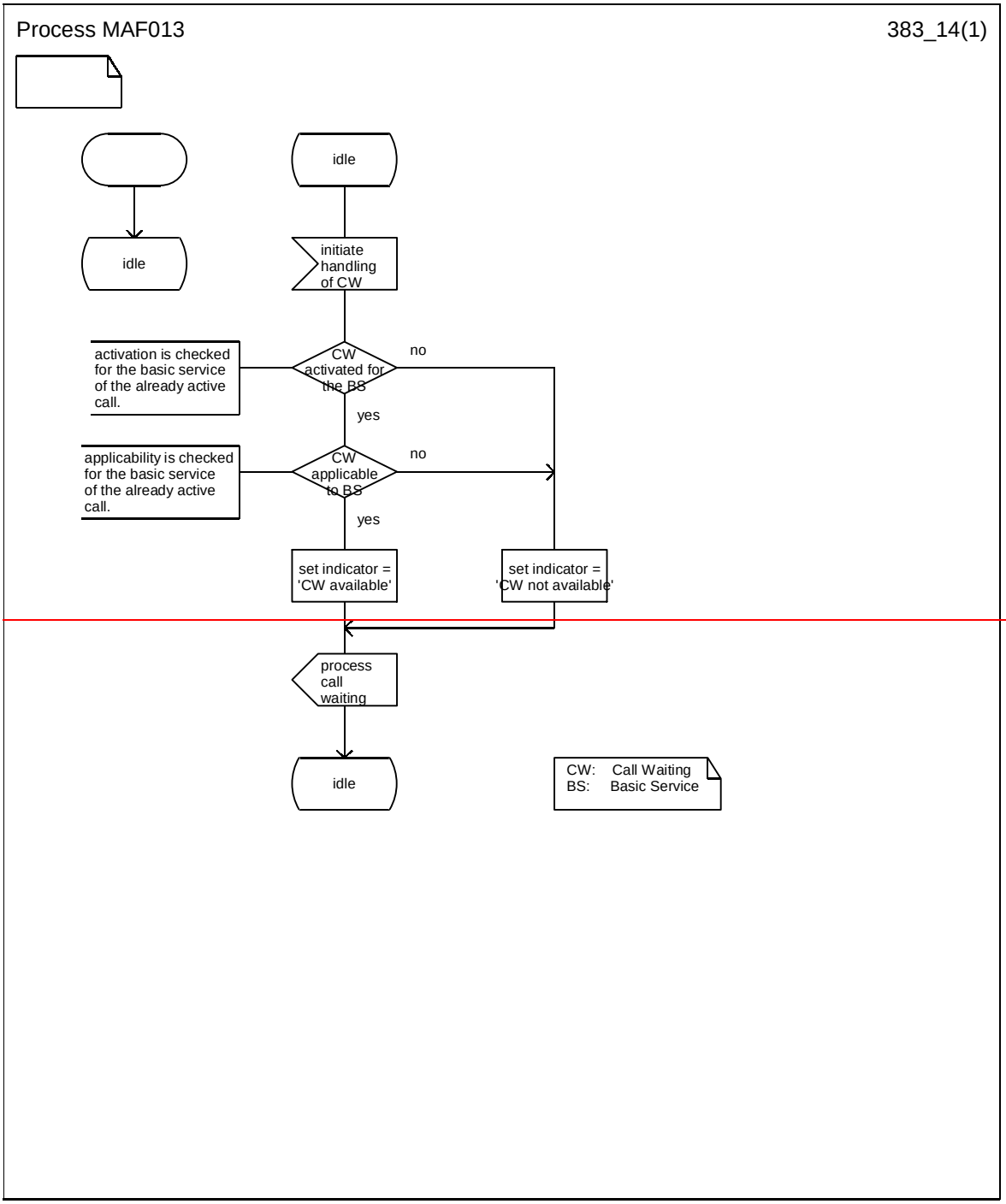
Other Events

The following events are treated as described in subclause 1.2.1.1:

- release of active call;
- release of call by user C;
- call hold service;
- indication of UDUB;
- rejection of call from user C.

Acceptance of waiting call

A precondition for the acceptance of the waiting call is that there is no other call in the (active, idle) state. The user can achieve this by releasing active calls, or using the call hold service. When user B accepts the call from user C it becomes the (active, idle) call. Timer T2 or T3 is stopped. The call waiting service is resumed for further incoming calls.


Process MAF013
383_14(1)
idle
idle
initiate handling of CW
activation is checked for the basic service of the already active call.
CW activated for the BS
no
yes
applicability is checked for the basic service of the already active call.
CW applicable to BS
no
yes
set indicator = 'CW available'
set indicator = 'CW not available'
process call waiting
idle
CW: Call Waiting
BS: Basic Service

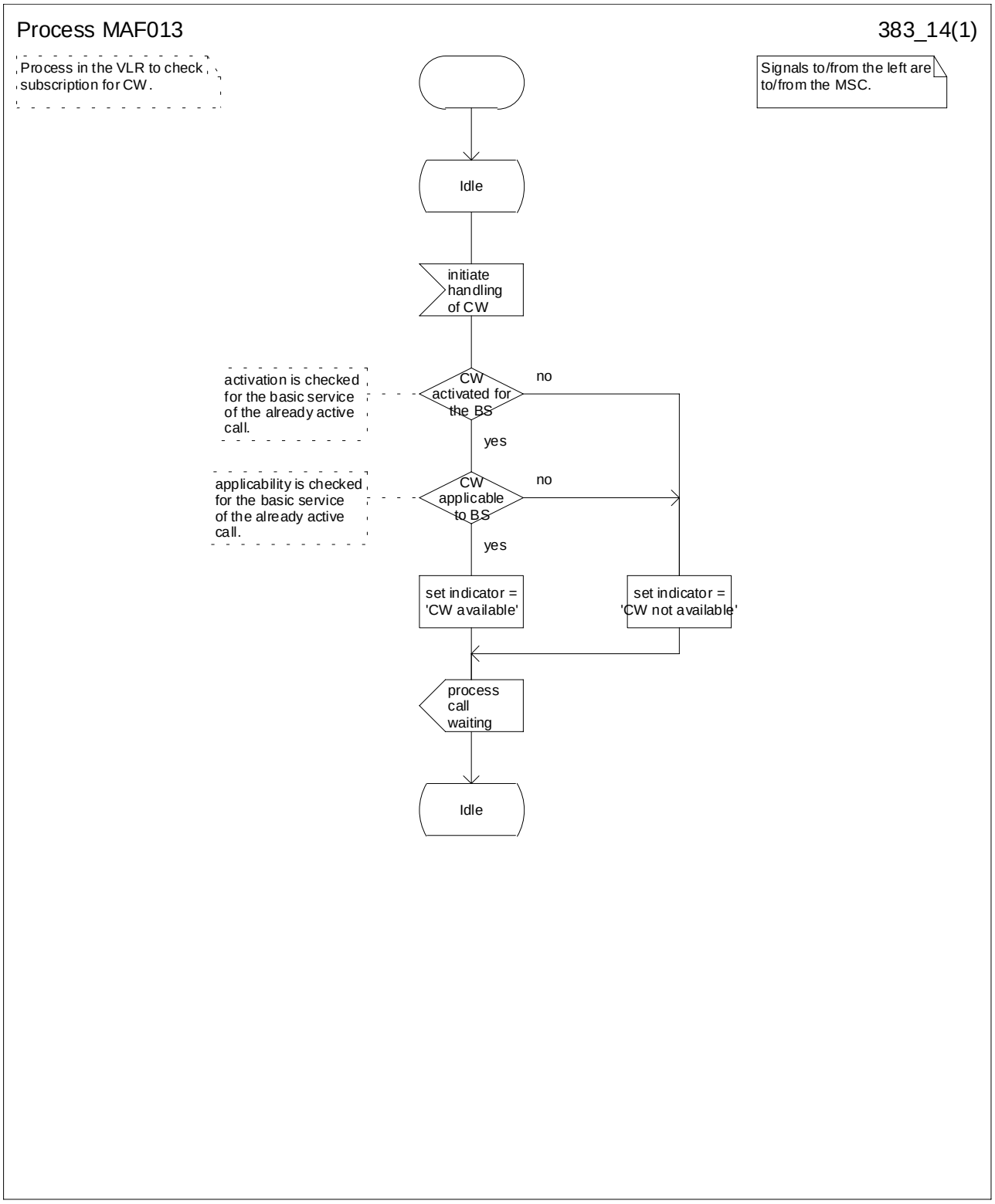
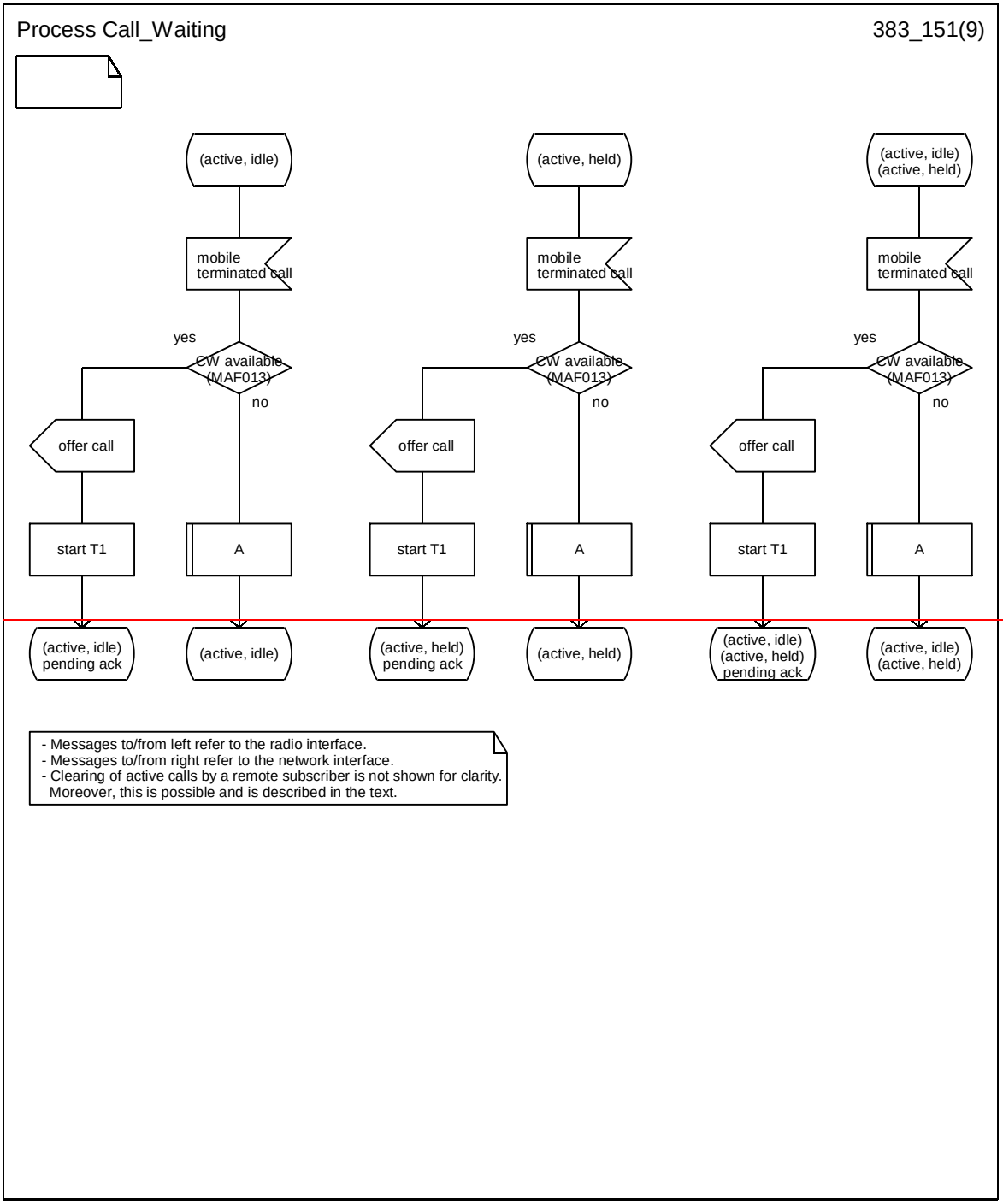


Figure 1.4: MAF013 Call waiting related authorisations examination (VLR)


Process Call_Waiting
383_151(9)
(active, idle)
mobile terminated call
yes
CW available (MAF013)
no
offer call
start T1
A
(active, idle) pending ack
(active, idle)
(active, held)
mobile terminated call
yes
CW available (MAF013)
no
offer call
start T1
A
(active, held) pending ack
(active, held)
(active, idle) (active, held)
mobile terminated call
yes
CW available (MAF013)
no
offer call
start T1
A
(active, idle) (active, held) pending ack
(active, idle) (active, held)
- Messages to/from left refer to the radio interface.
- Messages to/from right refer to the network interface.
- Clearing of active calls by a remote subscriber is not shown for clarity. Moreover, this is possible and is described in the text.

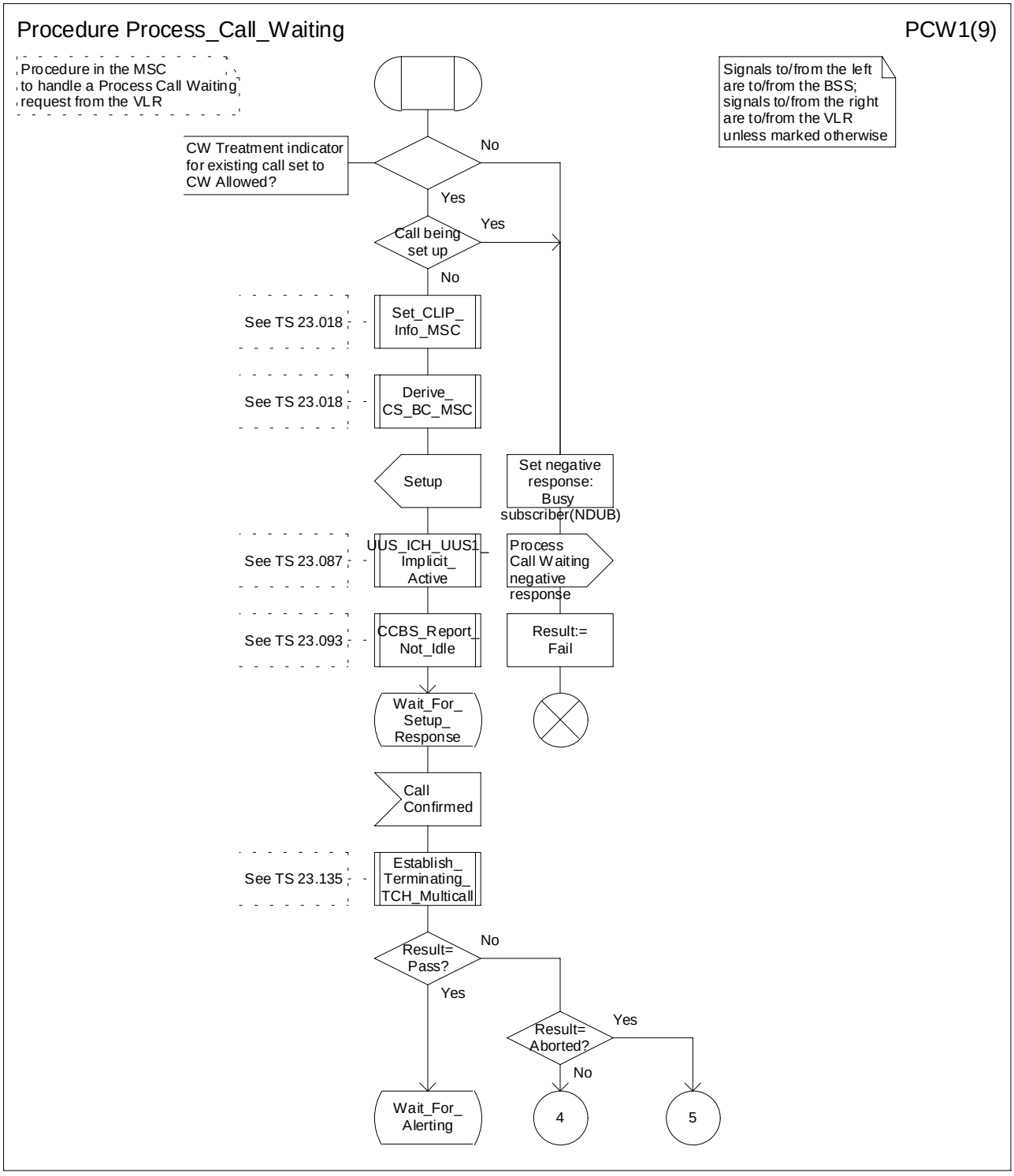
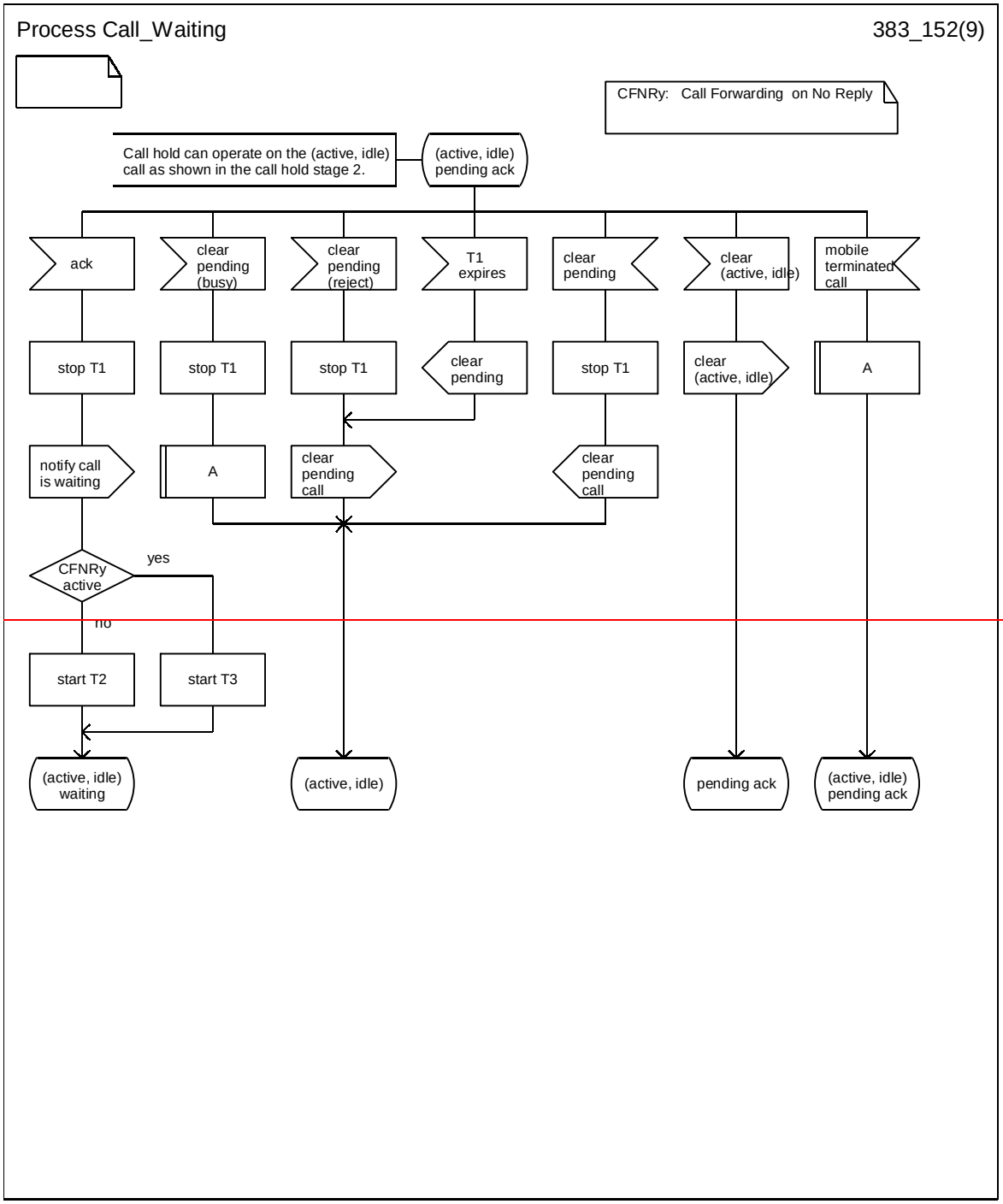


Figure 1.5 (sheet 1 of 910): Procedure Process_Call_WaitingOverall SDL diagram of call waiting


Process Call_Waiting
383_152(9)
CFNRy: Call Forwarding on No Reply
Call hold can operate on the (active, idle) call as shown in the call hold stage 2.
(active, idle) pending ack
ack
clear pending (busy)
clear pending (reject)
T1 expires
clear pending
clear (active, idle)
mobile terminated call
stop T1
stop T1
stop T1
clear pending
stop T1
clear (active, idle)
A
notify call is waiting
A
clear pending call
clear pending call
CFNRy active
yes
no
start T2
start T3
(active, idle) waiting
(active, idle)
pending ack
(active, idle) pending ack

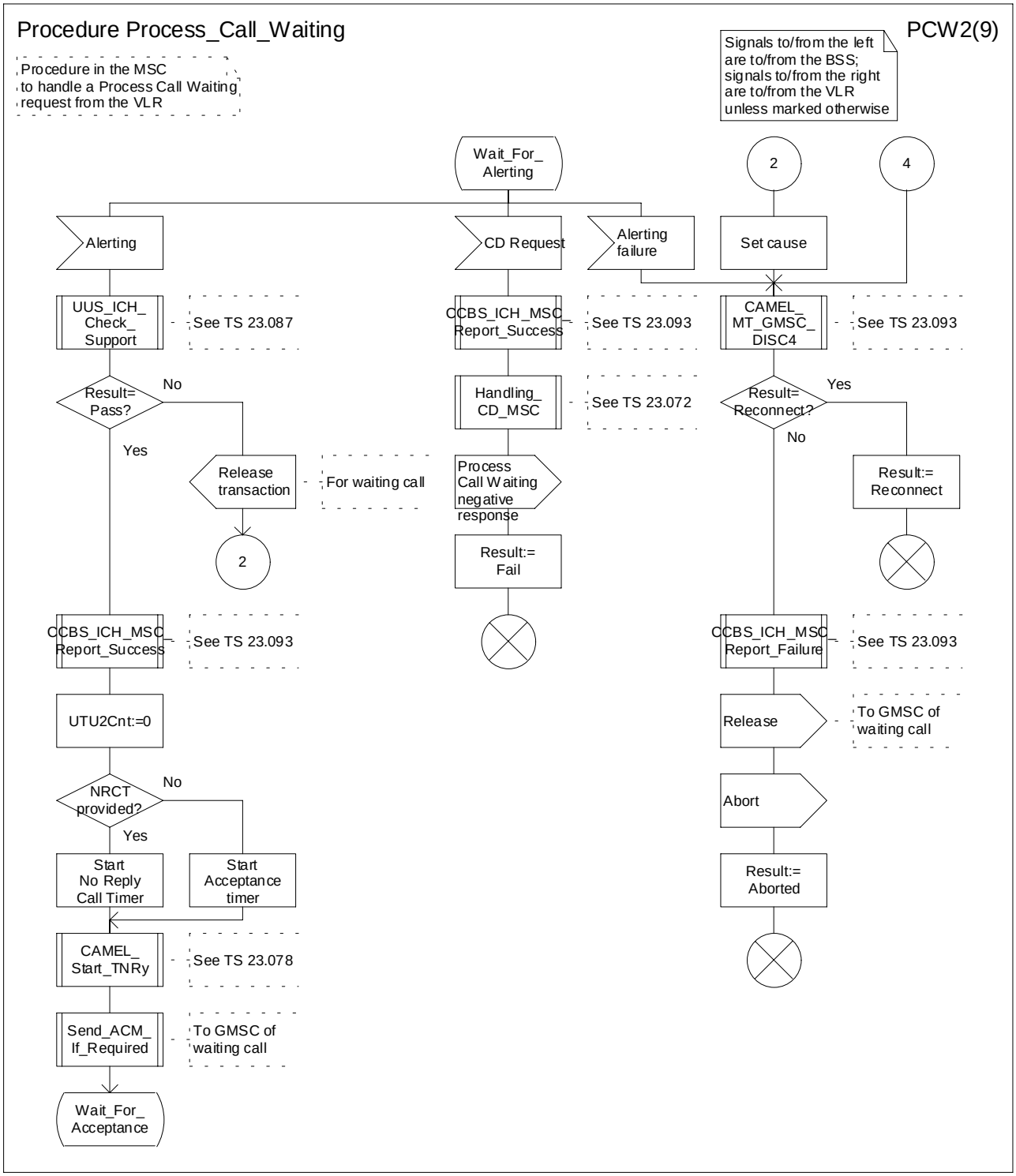
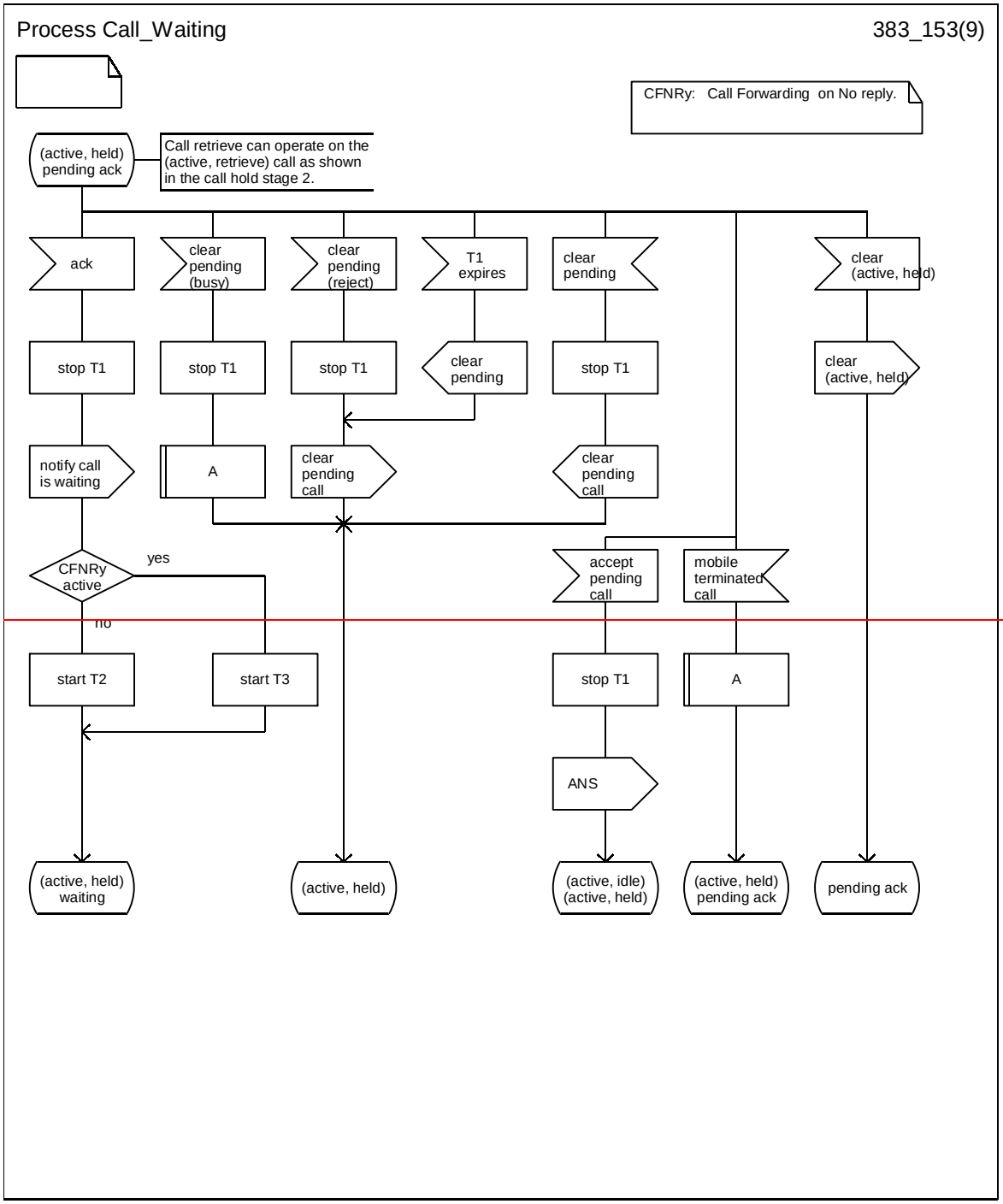


Figure 1.5 (sheet 2 of 910): Procedure Process_Call_Waiting~~Overall SDL diagram of call waiting~~


Process Call_Waiting
383_153(9)
CFNRy: Call Forwarding on No reply.
(active, held) pending ack
Call retrieve can operate on the (active, retrieve) call as shown in the call hold stage 2.
ack
clear pending (busy)
clear pending (reject)
T1 expires
clear pending
clear (active, held)
stop T1
stop T1
stop T1
clear pending
stop T1
clear (active, held)
notify call is waiting
A
clear pending call
clear pending call
CFNRy active
yes
no
accept pending call
mobile terminated call
start T2
start T3
stop T1
A
ANS
(active, held) waiting
(active, held)
(active, idle) (active, held)
(active, held) pending ack
pending ack

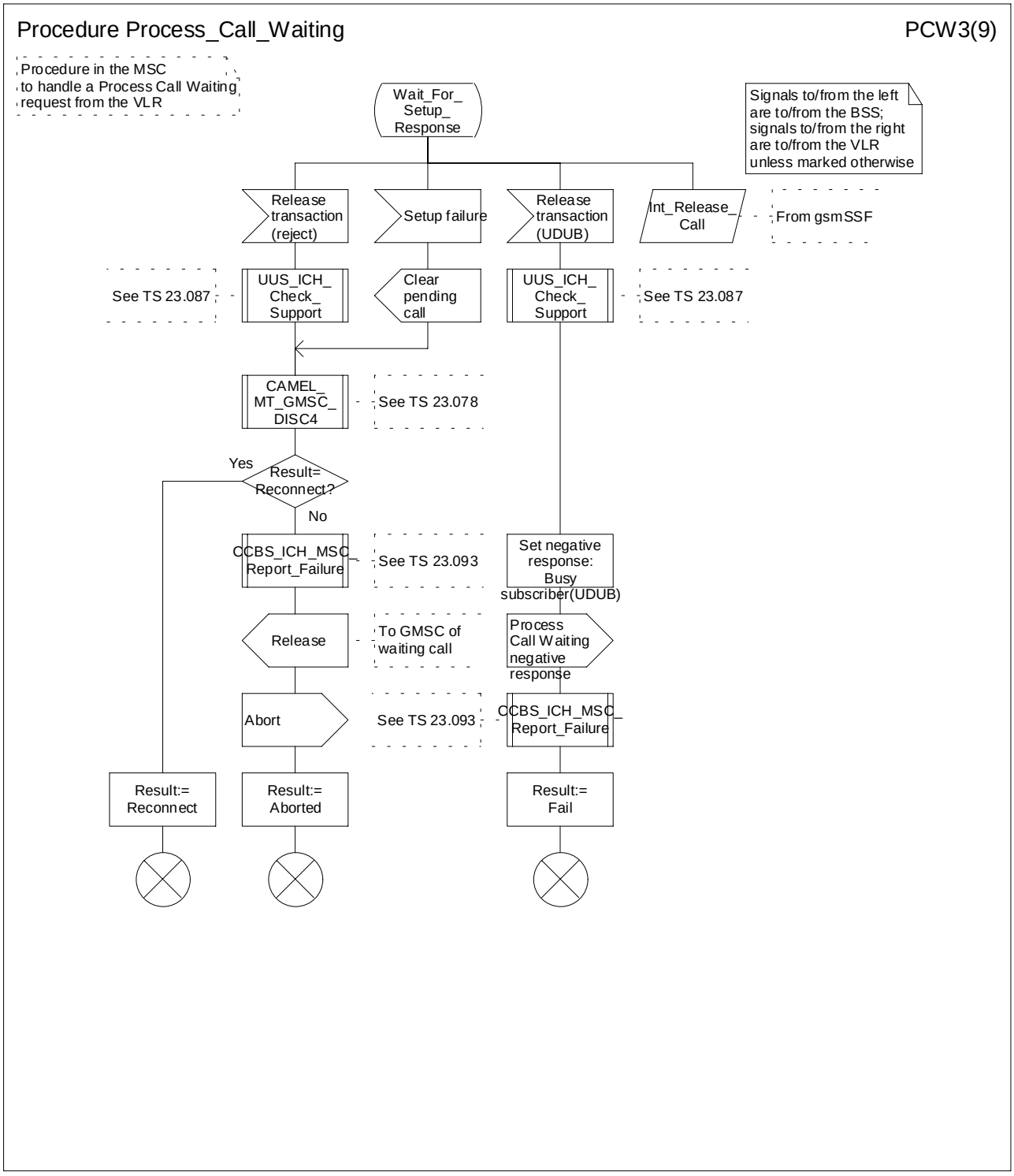
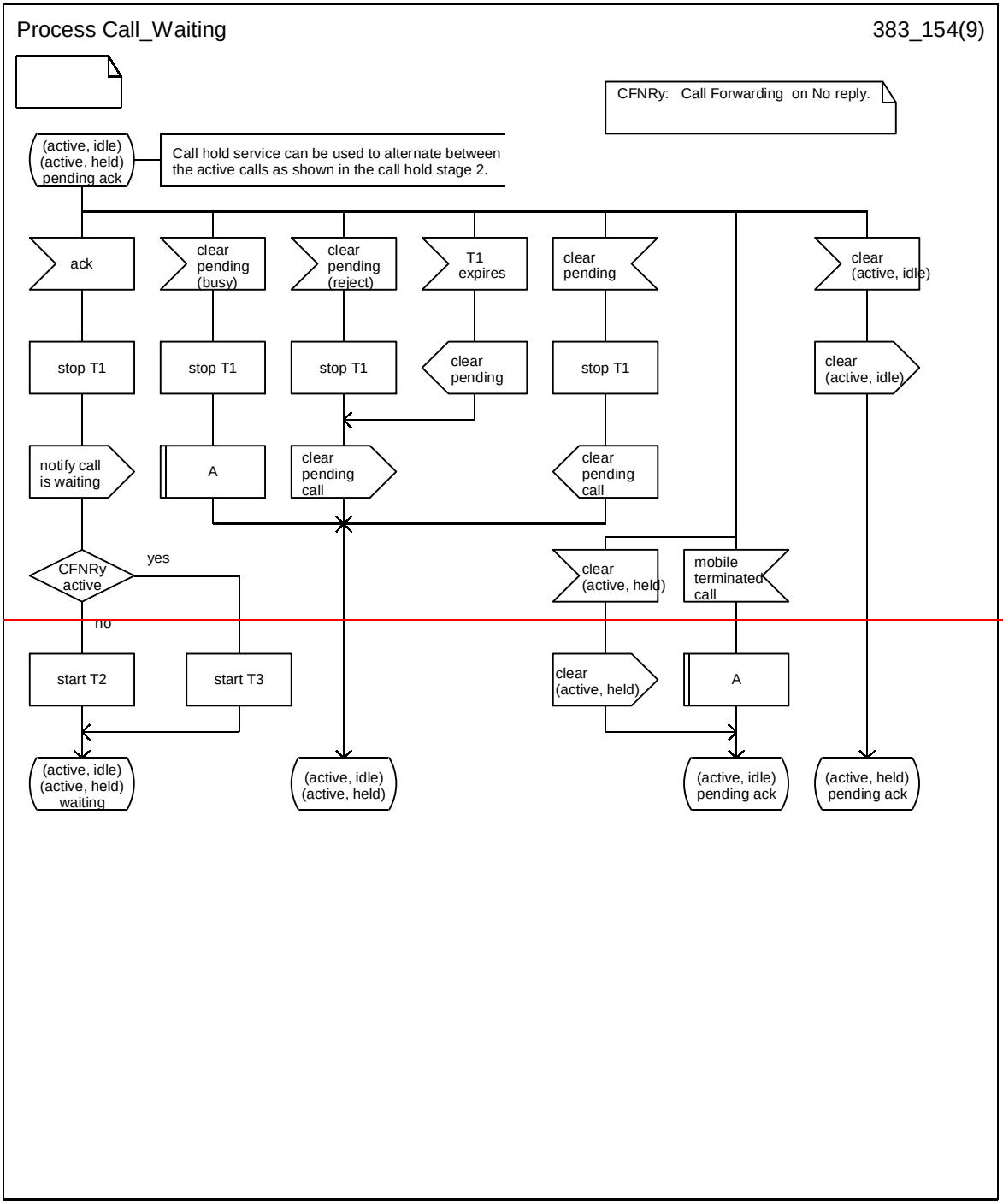


Figure 1.5 (sheet 3 of 910): Procedure Process_Call_WaitingOverall SDL diagram of call waiting


Process Call_Waiting
383_154(9)
CFNRy: Call Forwarding on No reply.
(active, idle)
(active, held)
pending ack
Call hold service can be used to alternate between the active calls as shown in the call hold stage 2.
ack
clear pending (busy)
clear pending (reject)
T1 expires
clear pending
clear (active, idle)
stop T1
stop T1
stop T1
clear pending
stop T1
clear (active, idle)
notify call is waiting
A
clear pending call
clear pending call
CFNRy active
yes
no
clear (active, held)
mobile terminated call
start T2
start T3
clear (active, held)
A
(active, idle)
(active, held)
waiting
(active, idle)
(active, held)
(active, idle)
pending ack
(active, held)
pending ack

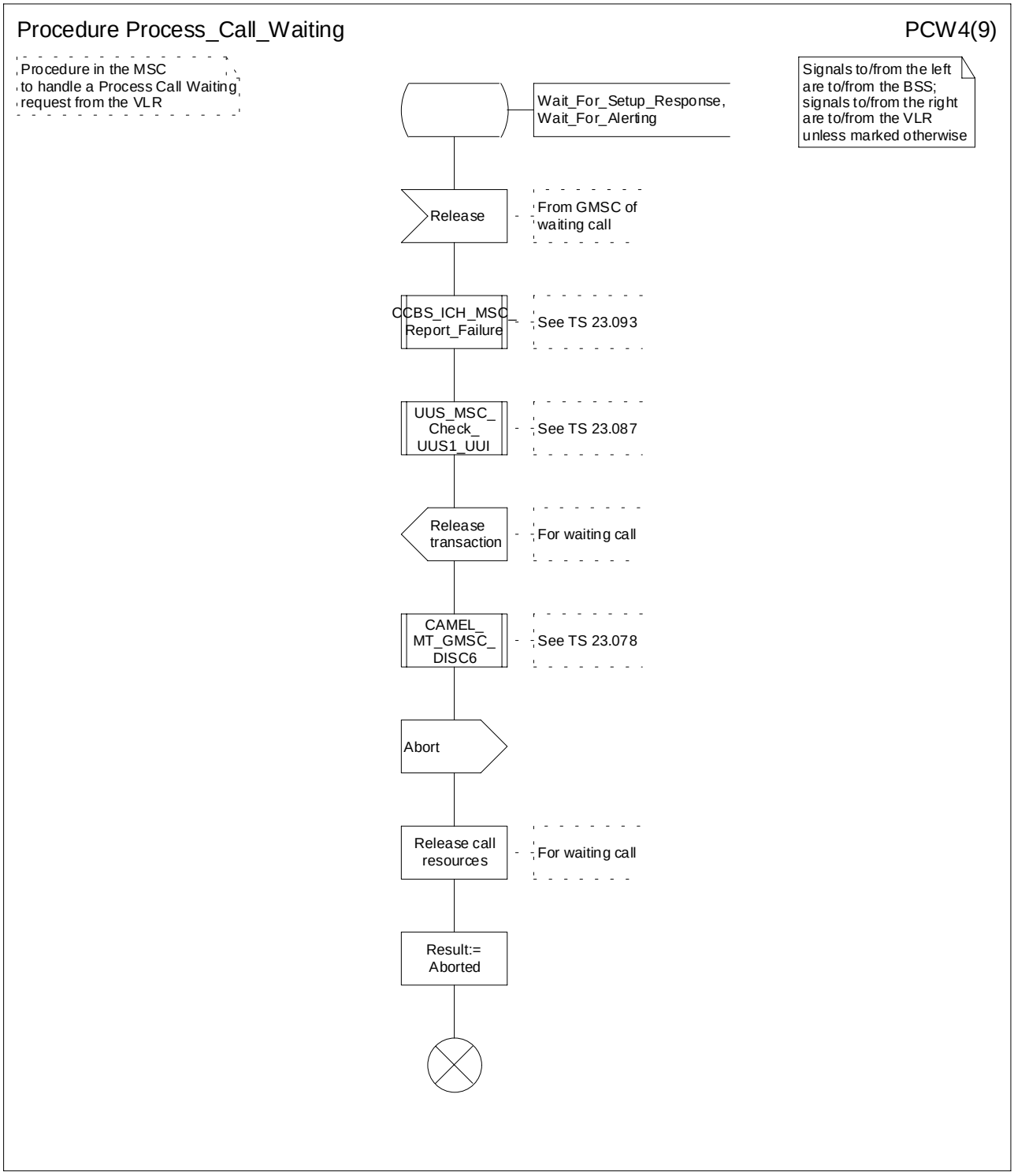
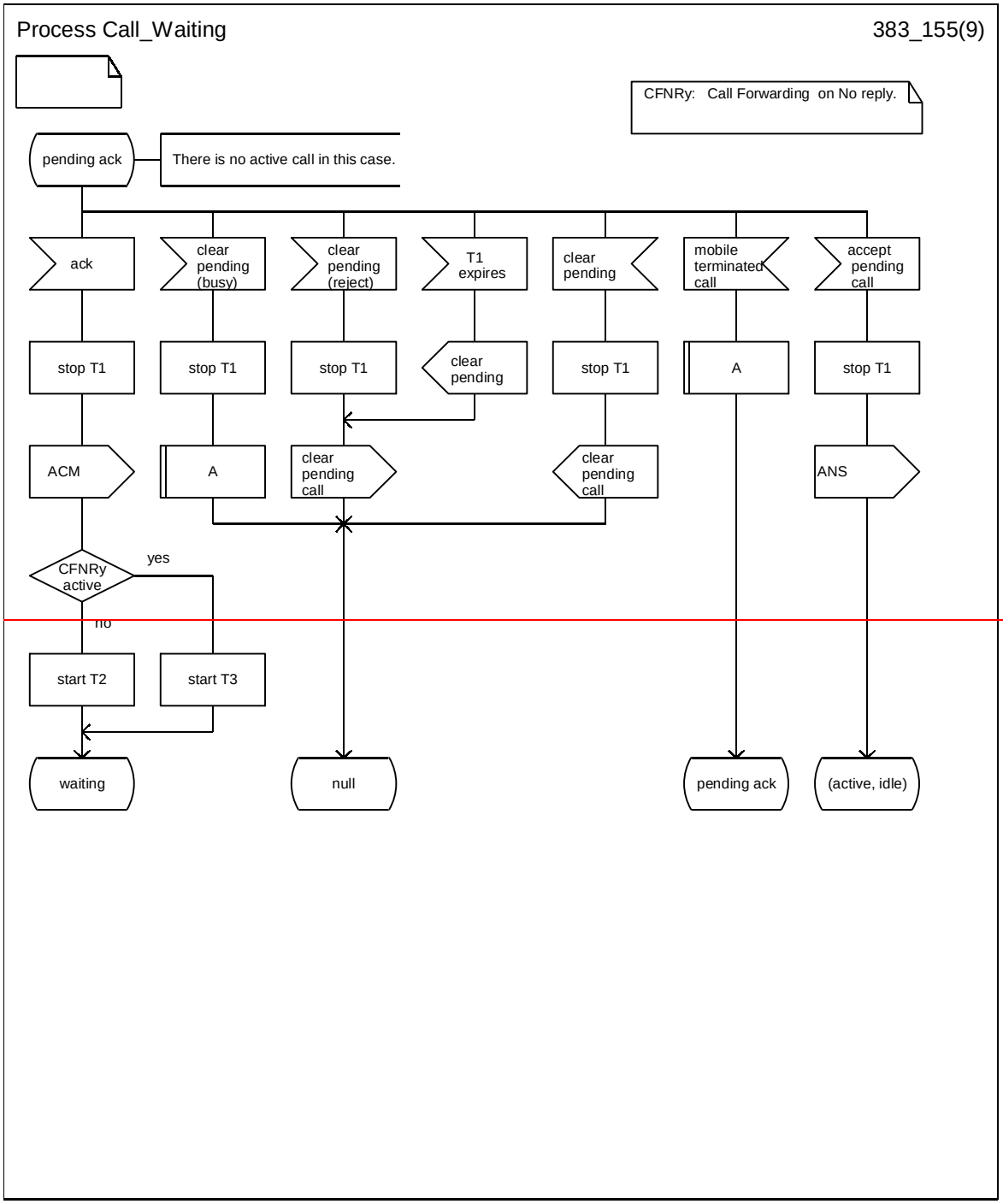


Figure 1.5 (sheet 4 of 910): Procedure Process_Call_WaitingOverall SDL diagram of call waiting


Process Call_Waiting
383_155(9)
CFNRy: Call Forwarding on No reply.
pending ack
There is no active call in this case.
ack
clear pending (busy)
clear pending (reject)
T1 expires
clear pending
mobile terminated call
accept pending call
stop T1
stop T1
stop T1
clear pending
stop T1
A
stop T1
ACM
A
clear pending call
clear pending call
ANS
CFNRy active
yes
no
start T2
start T3
waiting
null
pending ack
(active, idle)

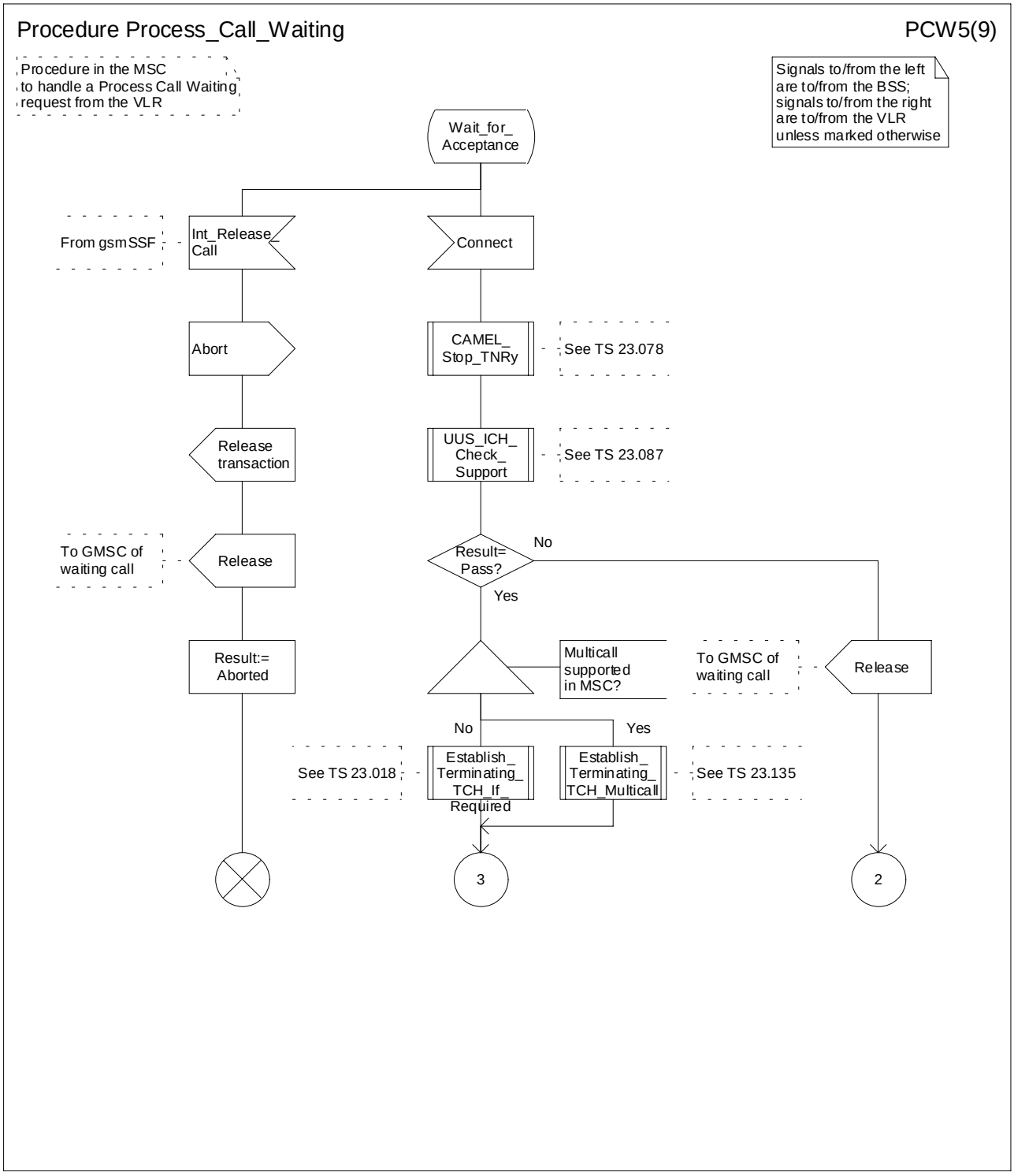
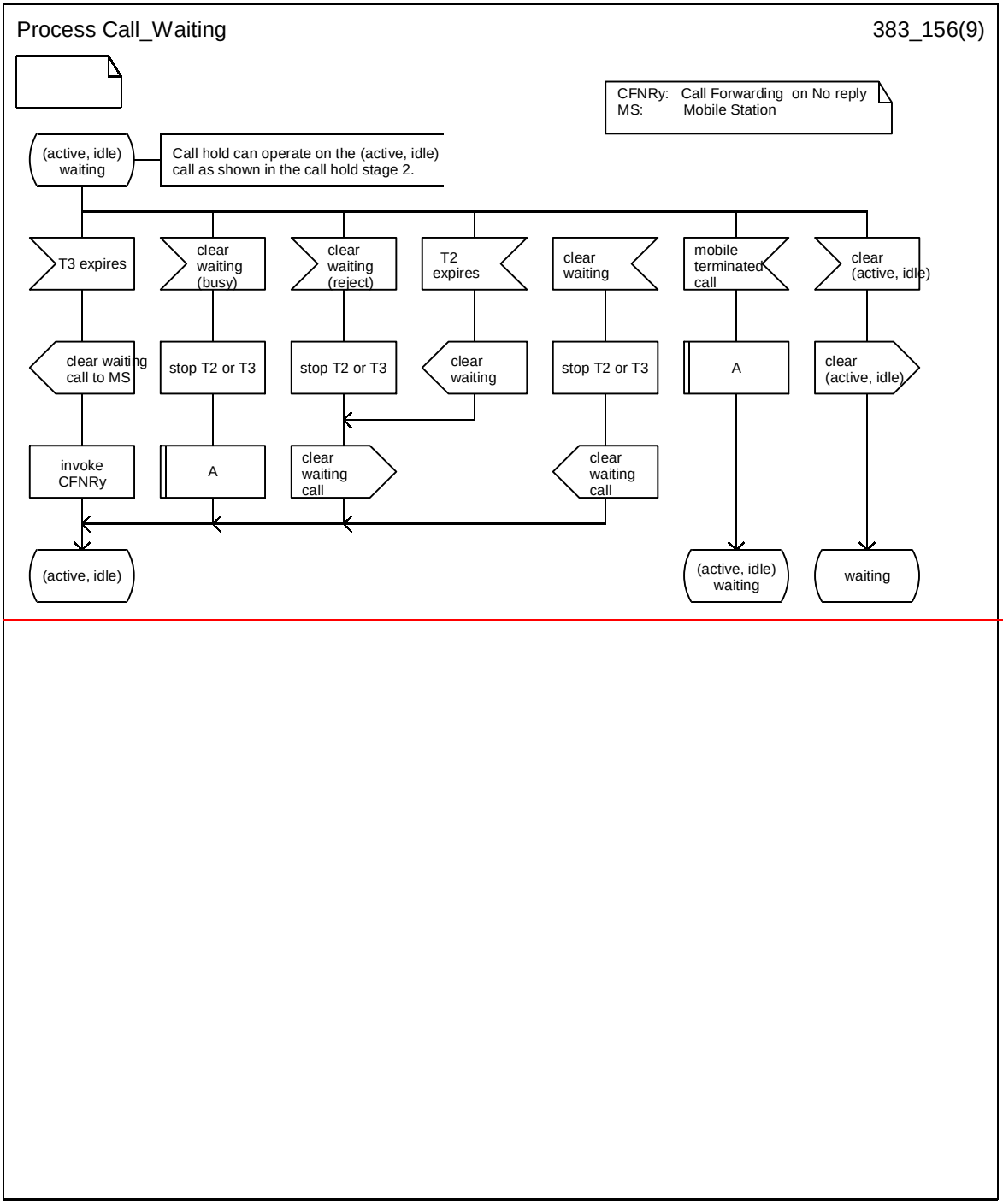


Figure 1.5 (sheet 5 of 910): Procedure Process_Call_WaitingOverall SDL diagram of call waiting


Process Call_Waiting
383_156(9)
CFNRy: Call Forwarding on No reply
MS: Mobile Station
(active, idle) waiting
Call hold can operate on the (active, idle) call as shown in the call hold stage 2.
T3 expires
clear waiting (busy)
clear waiting (reject)
T2 expires
clear waiting
mobile terminated call
clear (active, idle)
clear waiting call to MS
stop T2 or T3
stop T2 or T3
clear waiting
stop T2 or T3
A
clear (active, idle)
invoke CFNRy
A
clear waiting call
clear waiting call
(active, idle)
(active, idle) waiting
waiting

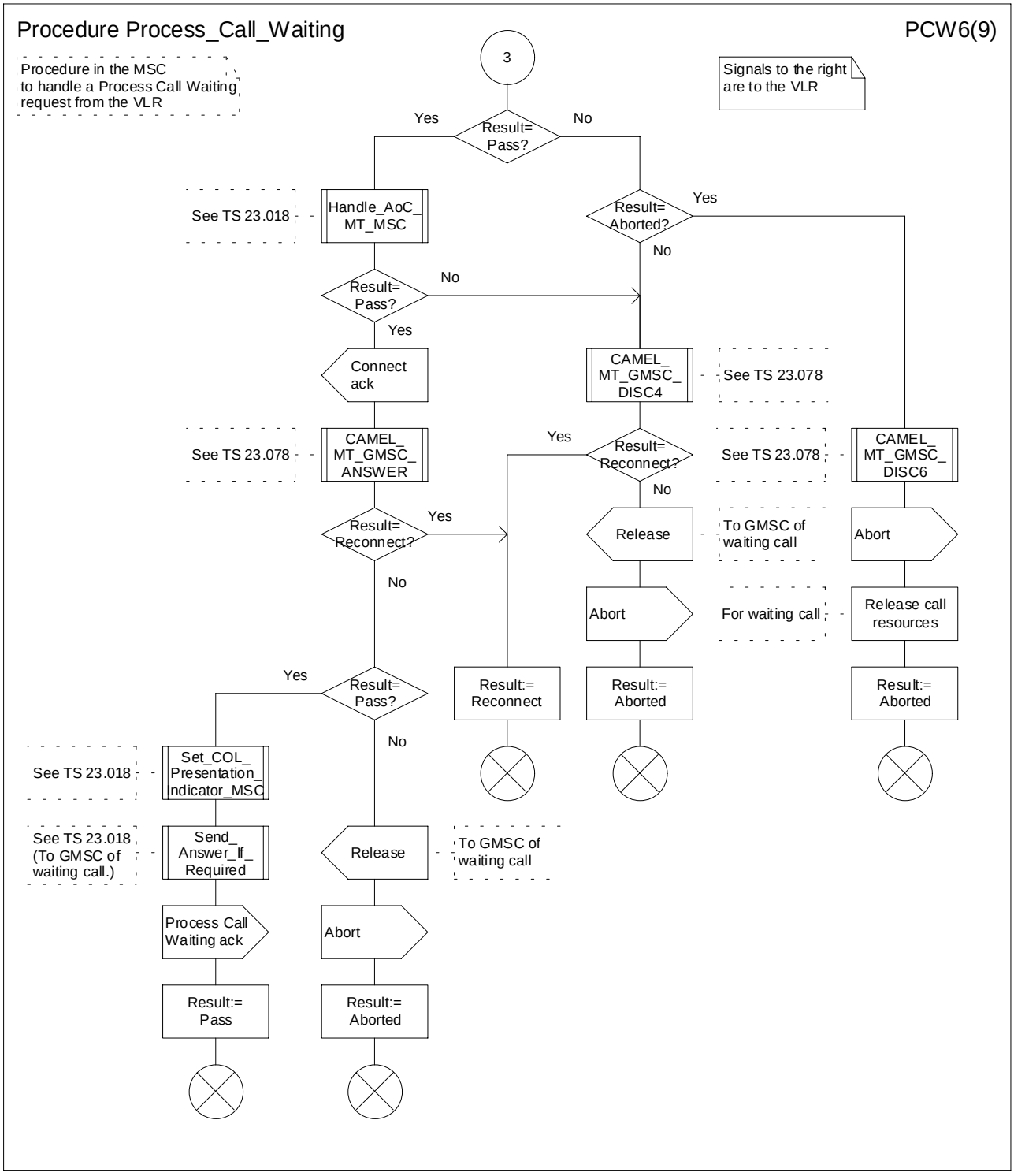
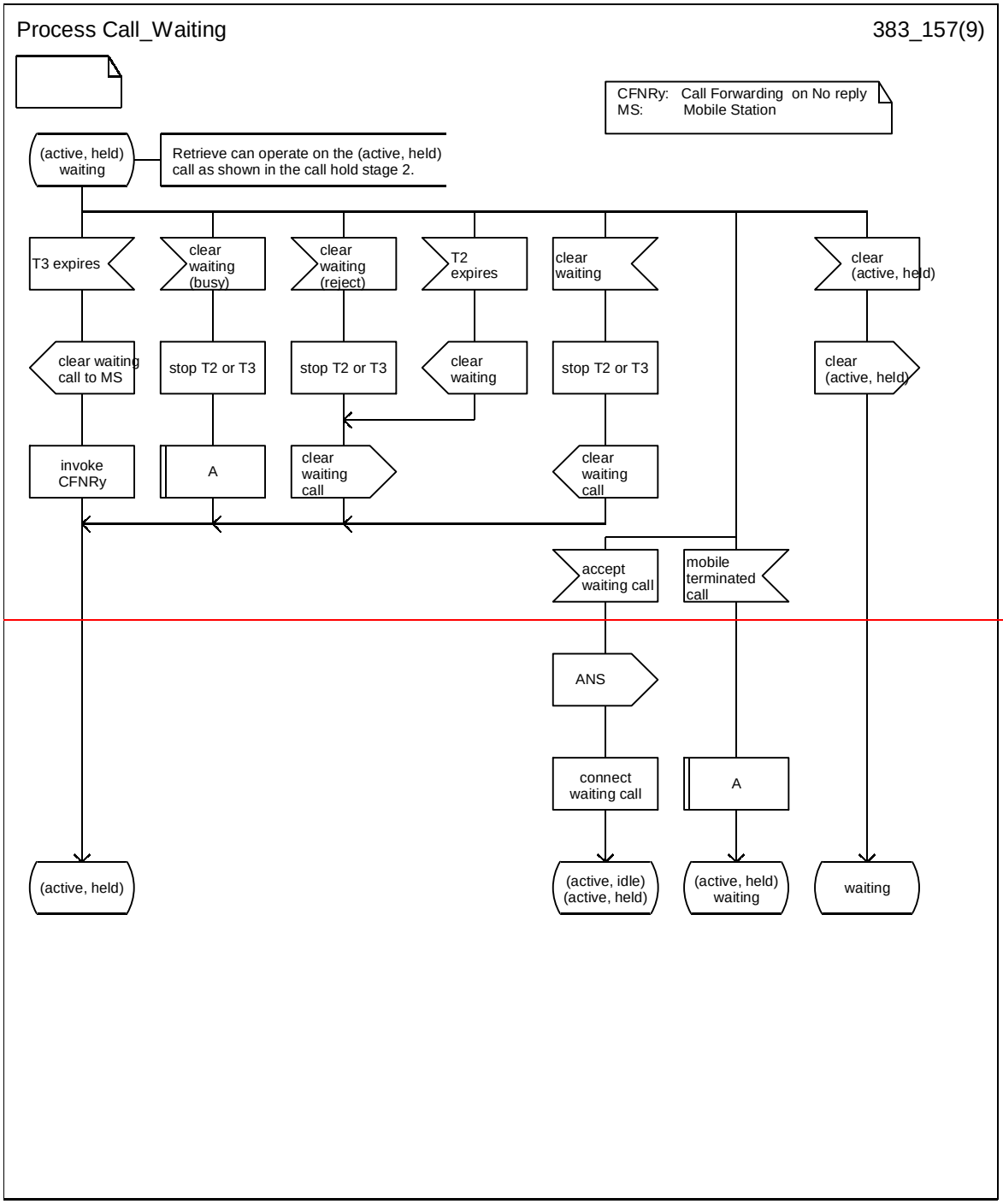


Figure 1.5 (sheet 6 of ~~9~~10): Procedure Process_Call_Waiting~~Overall SDL diagram of call waiting~~


Process Call_Waiting
383_157(9)
CFNRy: Call Forwarding on No reply
MS: Mobile Station
(active, held) waiting
Retrieve can operate on the (active, held) call as shown in the call hold stage 2.
T3 expires
clear waiting (busy)
clear waiting (reject)
T2 expires
clear waiting
clear (active, held)
clear waiting call to MS
stop T2 or T3
stop T2 or T3
clear waiting
stop T2 or T3
clear (active, held)
invoke CFNRy
A
clear waiting call
clear waiting call
accept waiting call
mobile terminated call
ANS
connect waiting call
A
(active, held)
(active, idle) (active, held)
(active, held) waiting
waiting

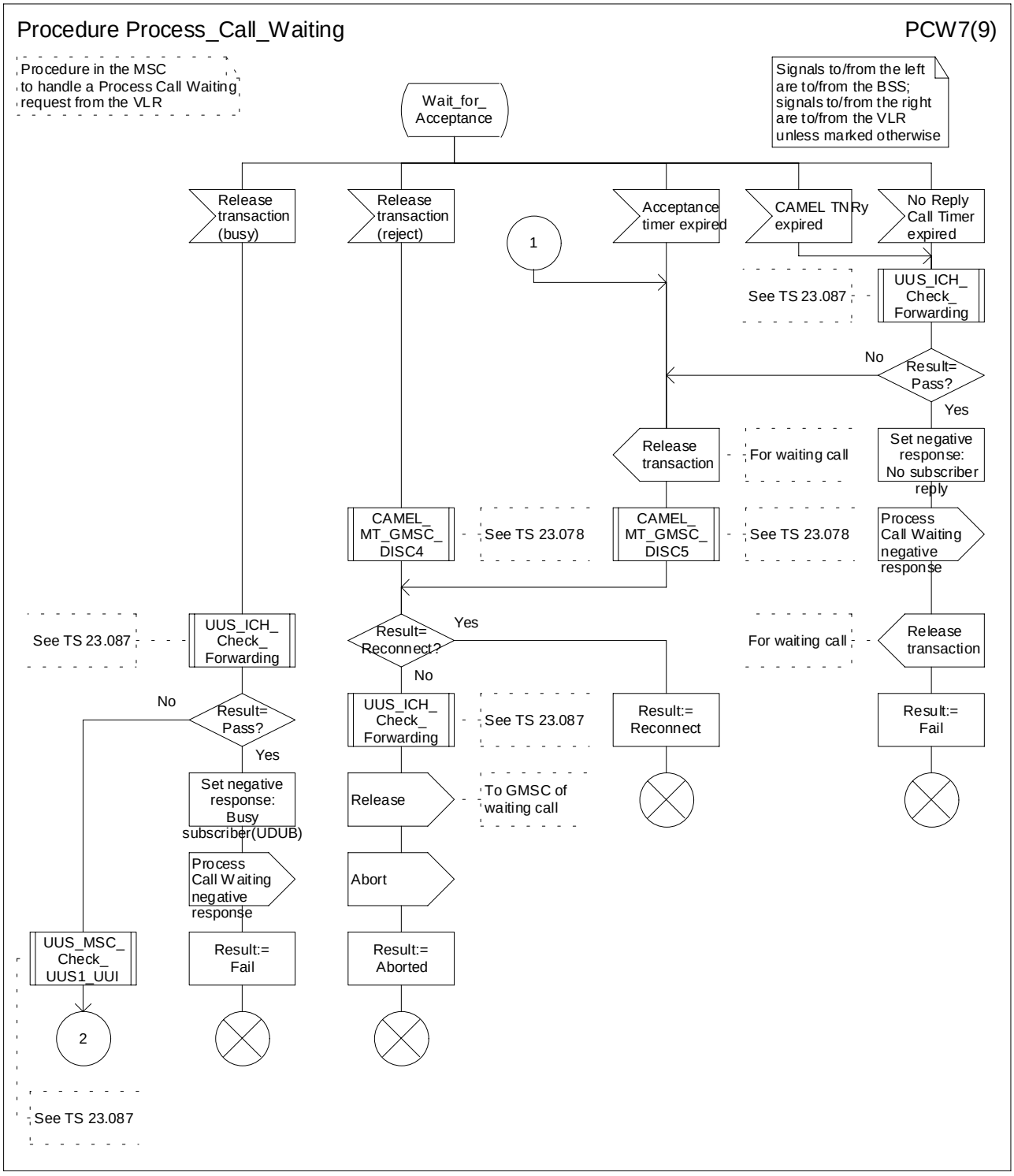
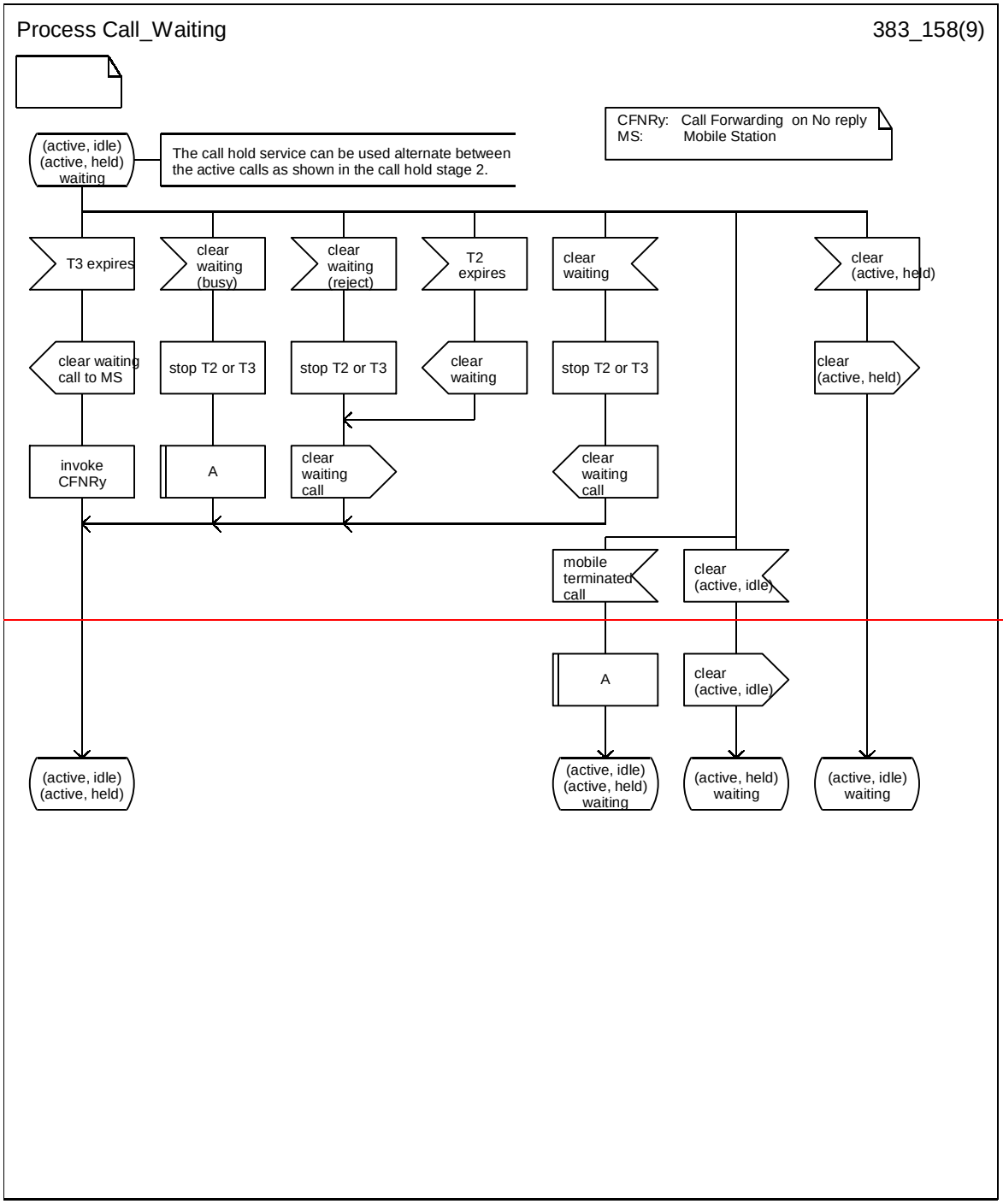


Figure 1.5 (sheet 7 of ~~9~~10): Procedure Process_Call_Waiting~~Overall SDL diagram of call waiting~~


Process Call_Waiting
383_158(9)
(active, idle)
(active, held)
waiting
The call hold service can be used alternate between the active calls as shown in the call hold stage 2.
CFNRy: Call Forwarding on No reply
MS: Mobile Station
T3 expires
clear waiting (busy)
clear waiting (reject)
T2 expires
clear waiting
clear (active, held)
clear waiting call to MS
stop T2 or T3
stop T2 or T3
clear waiting
stop T2 or T3
clear (active, held)
invoke CFNRy
A
clear waiting call
clear waiting call
mobile terminated call
clear (active, idle)
A
clear (active, idle)
(active, idle)
(active, held)
(active, idle)
(active, held)
waiting
(active, held)
waiting
(active, idle)
waiting

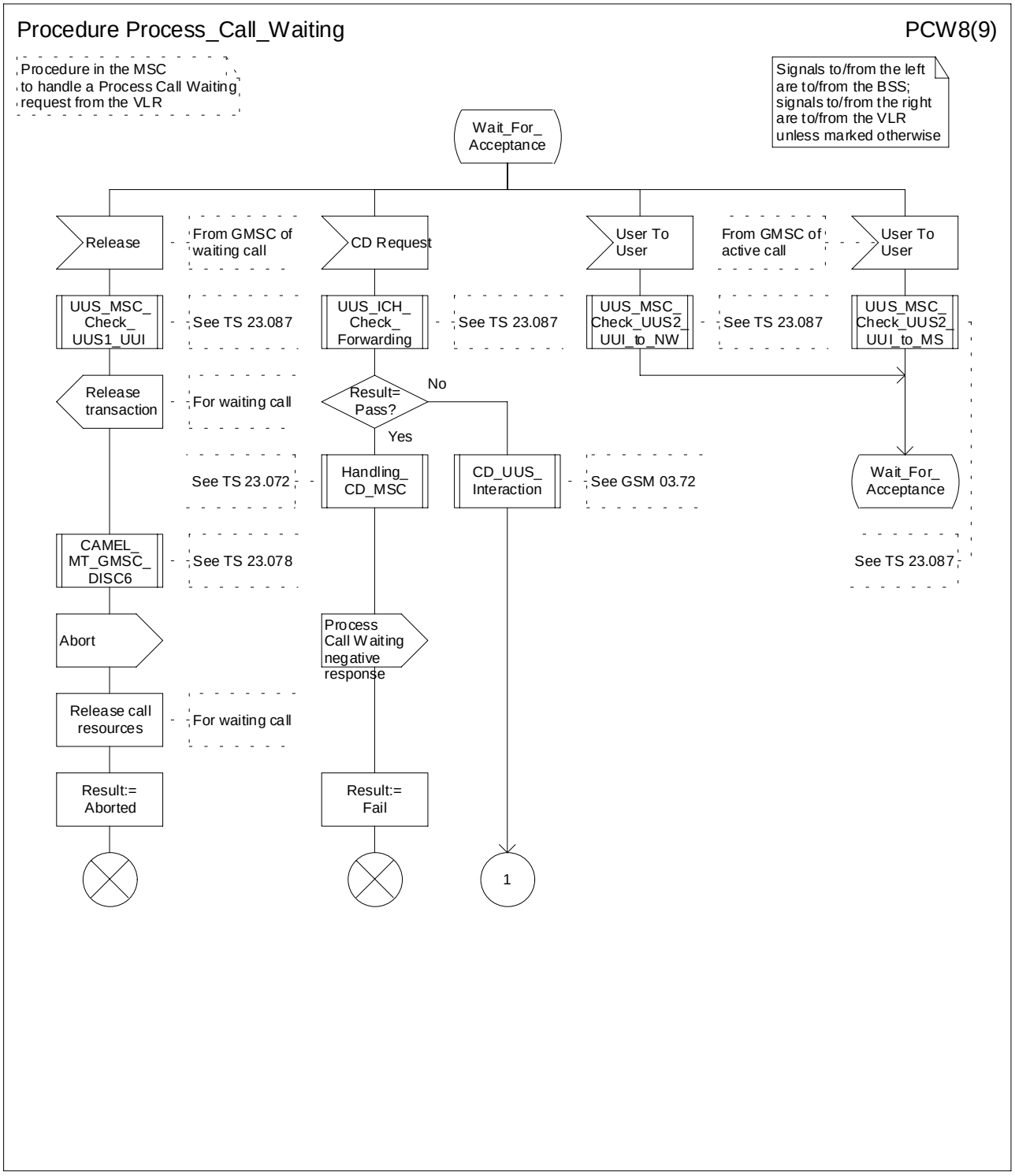
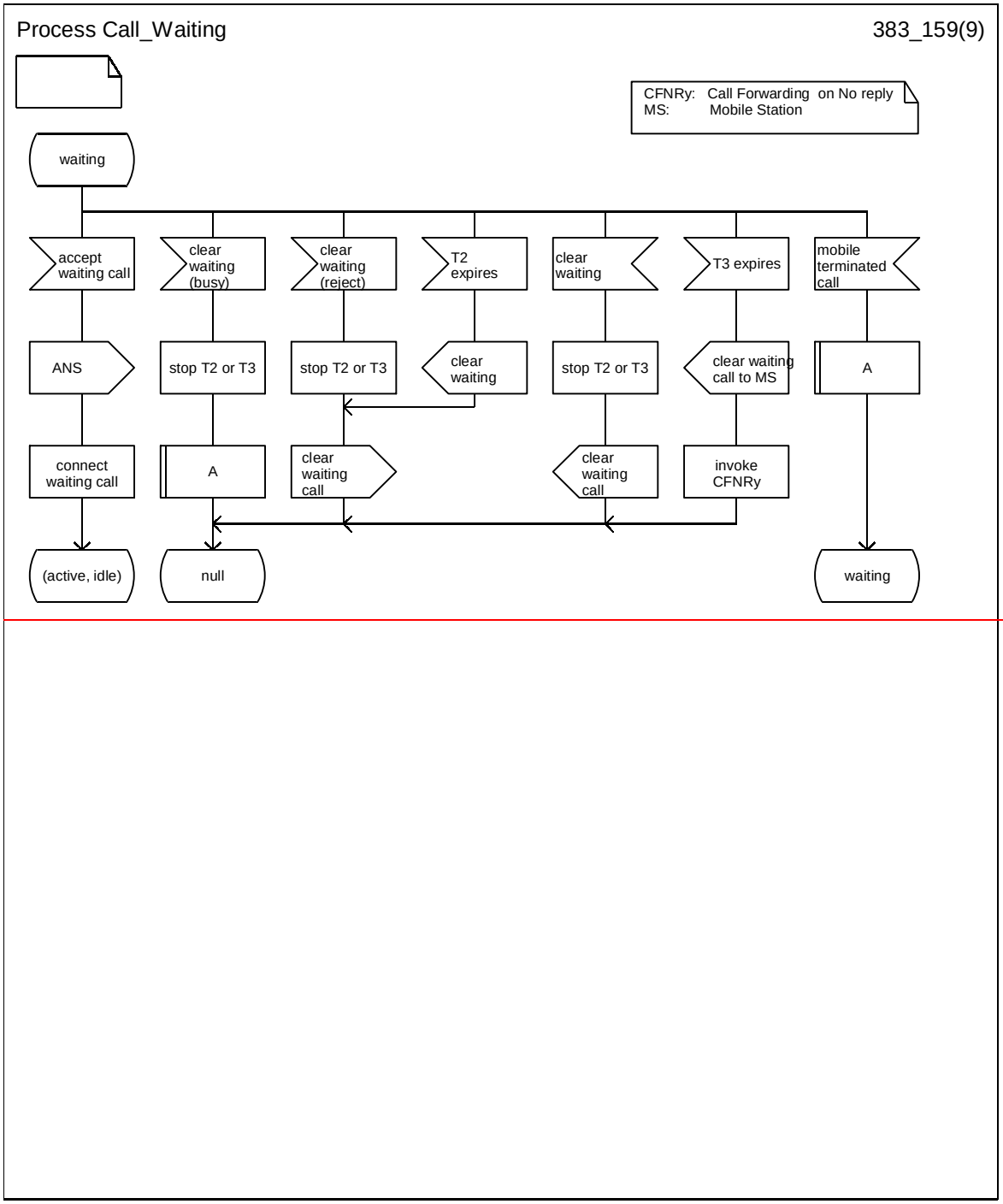


Figure 1.5 (sheet 8 of 910): Procedure Process_Call_WaitingOverall SDL diagram of call waiting


Process Call_Waiting
383_159(9)
CFNRy: Call Forwarding on No reply
MS: Mobile Station
waiting
accept waiting call
clear waiting (busy)
clear waiting (reject)
T2 expires
clear waiting
T3 expires
mobile terminated call
ANS
stop T2 or T3
stop T2 or T3
clear waiting
stop T2 or T3
clear waiting call to MS
A
connect waiting call
A
clear waiting call
clear waiting call
invoke CFNRy
(active, idle)
null
waiting

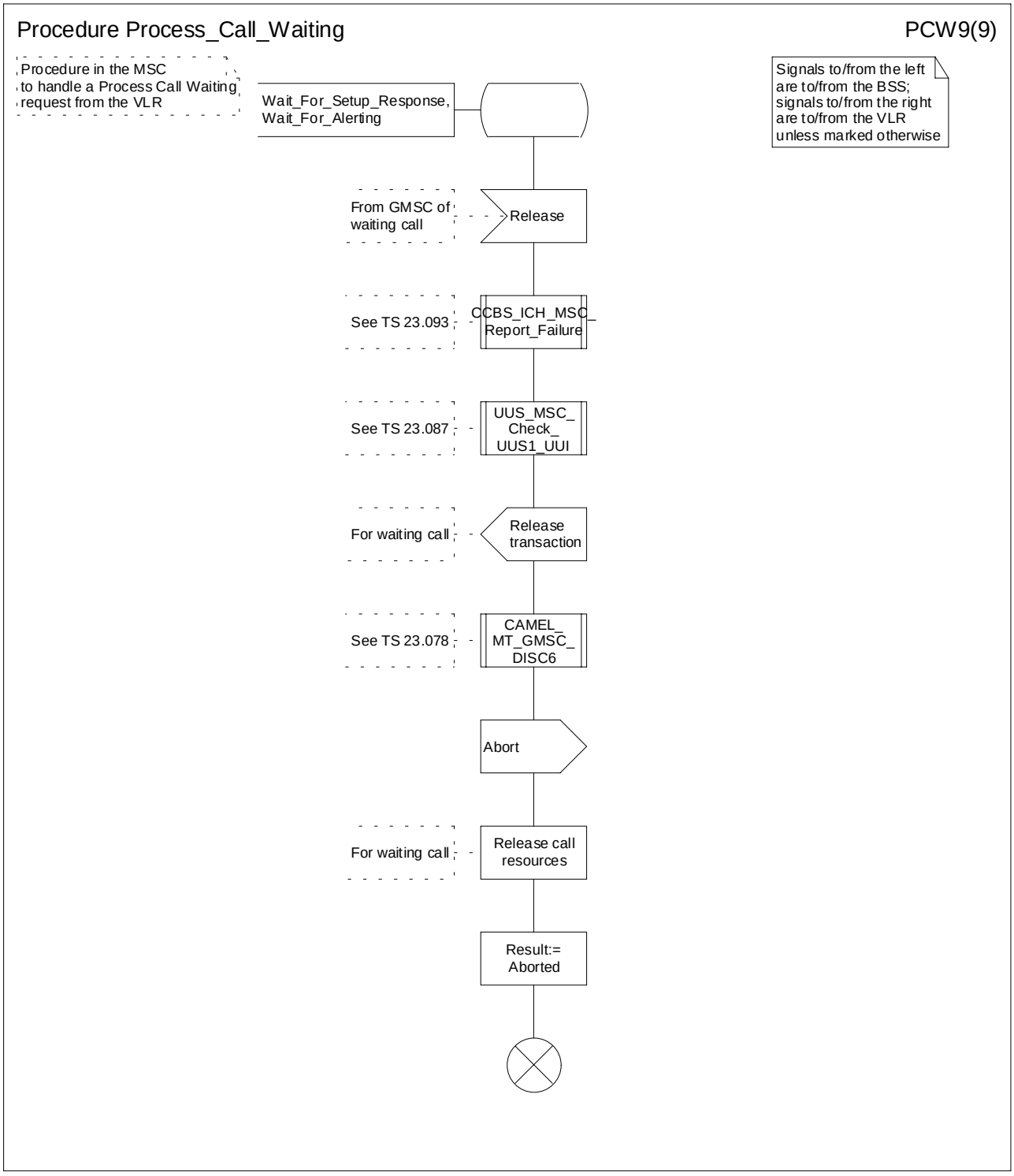
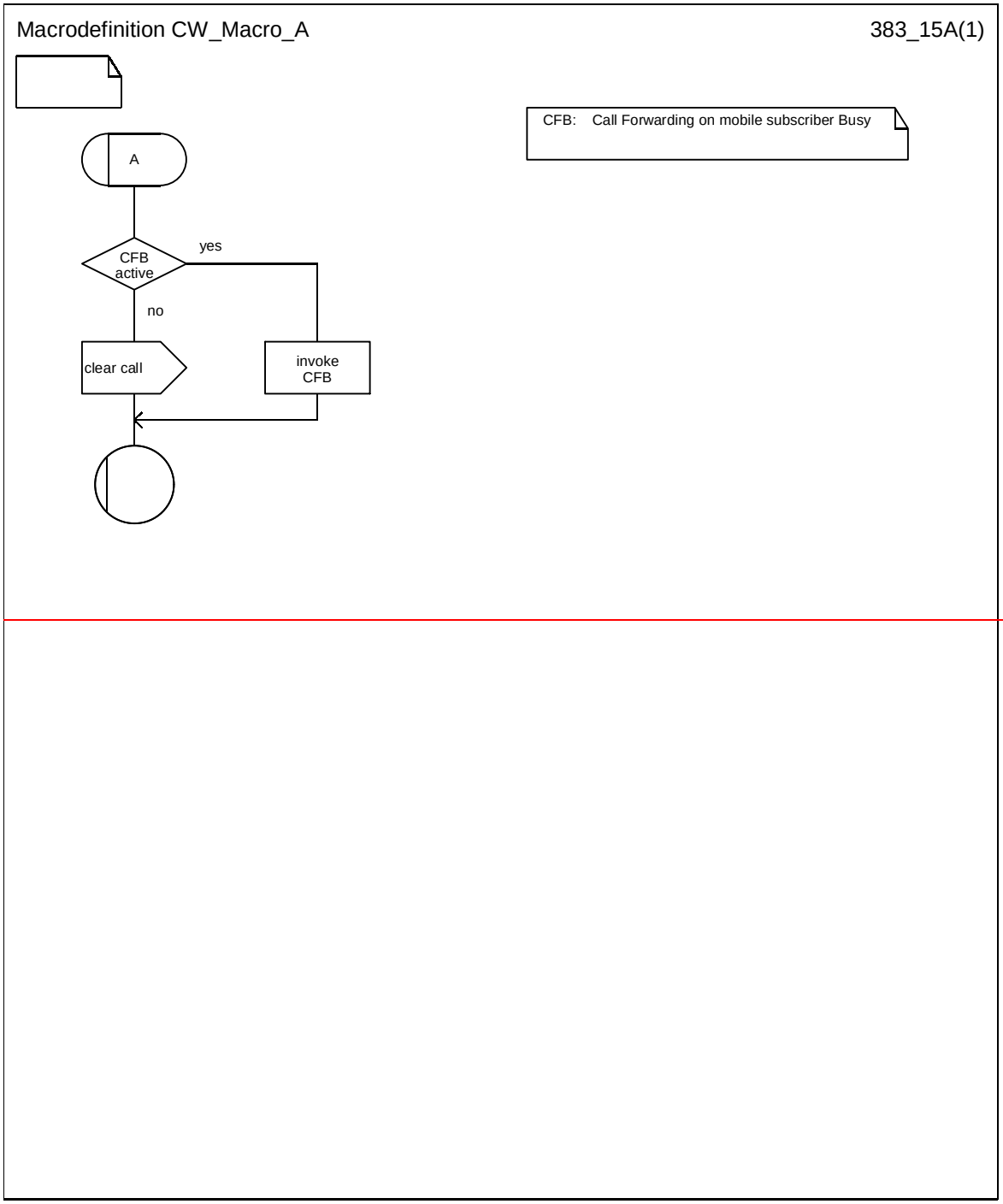


Figure 1.5 (sheet 9 of ~~9~~10): Procedure Process_Call_Waiting~~Overall SDL diagram of call waiting~~



~~Figure 1.5 (sheet 10 of 10): Overall SDL diagram of call waiting~~

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3GPP TSG-CN4 Meeting #06
Beijing, China, 15-19 Jan 2001

Tdoc N4-010024

CR-Form-v3

CHANGE REQUEST

⌘ **23.084** **CR** **003** ⌘ rev **-** ⌘ Current version: **3.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Enhancement of MPTY SDLs and CAMEL functionality.
Source:	⌘	CN4
Work item code:	⌘	TEI
Date:	⌘	4/12/00
Category:	⌘	**C**
Release:	⌘	REL-4

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

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

Reason for change:	⌘	Upon integrating MPTY into the Subs_FSM process in 3G TS 23.018, it is necessary to convert the original “overall” SDLs into a proper Procedure. Also, alignment with 23.078 (CAMEL) is needed.
Summary of change:	⌘	Changed the “overall SDLs” into a proper procedure, added CSI interactions (to align with 23.078) and updated references from GSM documents to 3GPP TSs. Some correcting of references and grammar have also been done.
Consequences if not approved:	⌘	This TS will be out of line with 23.078.

Clauses affected:	⌘	0.1, 0.2, 1.1		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.018, 23.078
Other comments:	⌘			

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

0 Scope

The present document gives the stage 2 description of the multi party supplementary services.
Only one multi party supplementary service has been defined, this is the Multi Party (MPTY) service, and is described in clause 1.

0.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 3GPP TR 21.905: "3G Vocabulary".
[2] 3GPP TS 23.011: "Technical realization of supplementary services - General Aspects".
[3] 3GPP TS 23.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".
[4] 3GPP TS 23.018: “Basic Call Handling”

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

0.2 Abbreviations

In addition to those below, ~~A~~abbreviations used in the present document are listed in 3GPP TR 21.905 [1].

SII2 Service Interaction Indicators Two

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

1 Multi Party service (MPTY)

1.1 Functions and information flows

The following Mobile Additional Function has been identified for the Multi Party service:

MAF026
Multi Party service related authorizations examination
The ability of a PLMN component to determine the authorizations relating to Multi Party service. See figure 2.1.
Location: VLR

The ~~overall~~ SDL ~~-~~diagrams for the ~~of~~ Multi Party service ~~is~~ are shown in figures 1.2 and 1.3.
~~This overall SDL diagram represents the network as a whole.~~ The ~~overall SDL diagram~~ procedure Handle_MPTY shows the status of the service as perceived by the served mobile subscriber, as well as the status as perceived by any of the other parties. Beside this, the ~~overall~~ SDL ~~-~~ diagrams show~~s~~ the actions to be taken by the network and the information provided by the network to the users.
In figure 1.2, sheet 3 (state “Held_MPTY”) it is also possible to initiate a new call or process a call waiting request while in this state (see 3GPP TS 23.083) [3]. In either case, this is likely to result in the call handling state machine going into the state “Held_MPTY_and_active_call”.
~~Within the authorization examinations diagram, the messages shown to and from the left are to and from the VLR. Within the overall SDL diagram, messages to and from the served mobile subscriber are indicated to and from the left, whereas messages to and from remote parties are indicated to and from the right.~~
The information flow for the MPTY ~~Multi Party~~ service is shown in figure 1.~~3~~4~~.~~

In the information flow it is assumed that the served subscriber is a mobile subscriber and that the other parties are all fixed ISDN subscribers. For the purposes of the information flow diagrams it is assumed that there are only two remote parties. Where there are more than two remote parties, signals to any party connected to the MPTY bridge shall be sent ~~apply~~ to all other parties connected to the MPTY bridge, except where a single remote party is to be selected for a private communication.

As a consequence of this assumption, after the MPTY is split (to establish a private communication) it ~~only~~ contains only one remote party. However, the end state for disconnection of or by that remaining remote party is shown as A-B ACTIVE / MPTY HELD. This is to indicate that the disconnection by a single remote party will not necessarily cause the MPTY call to be released. This will ~~only~~ happen only when that remote party is the only remaining party in the MPTY call.

Party A is the subscriber controlling the MPTY call (serv~~ic~~ed mobile subscriber). Party B is the first remote party called. Party C is the second remote party called.

Remote parties are disconnected by the generic disconnect/release procedure. Any scenario requiring disconnection of remote parties shown in the SDL diagrams but not explicitly shown in the flow diagrams shall follow the procedure shown in the flow diagrams for similar scenarios.

Functions to be performed by the fixed ISDN (for example hold authorizations examination) are not shown in the information flow; only the functions to be performed by the PLMN are shown.

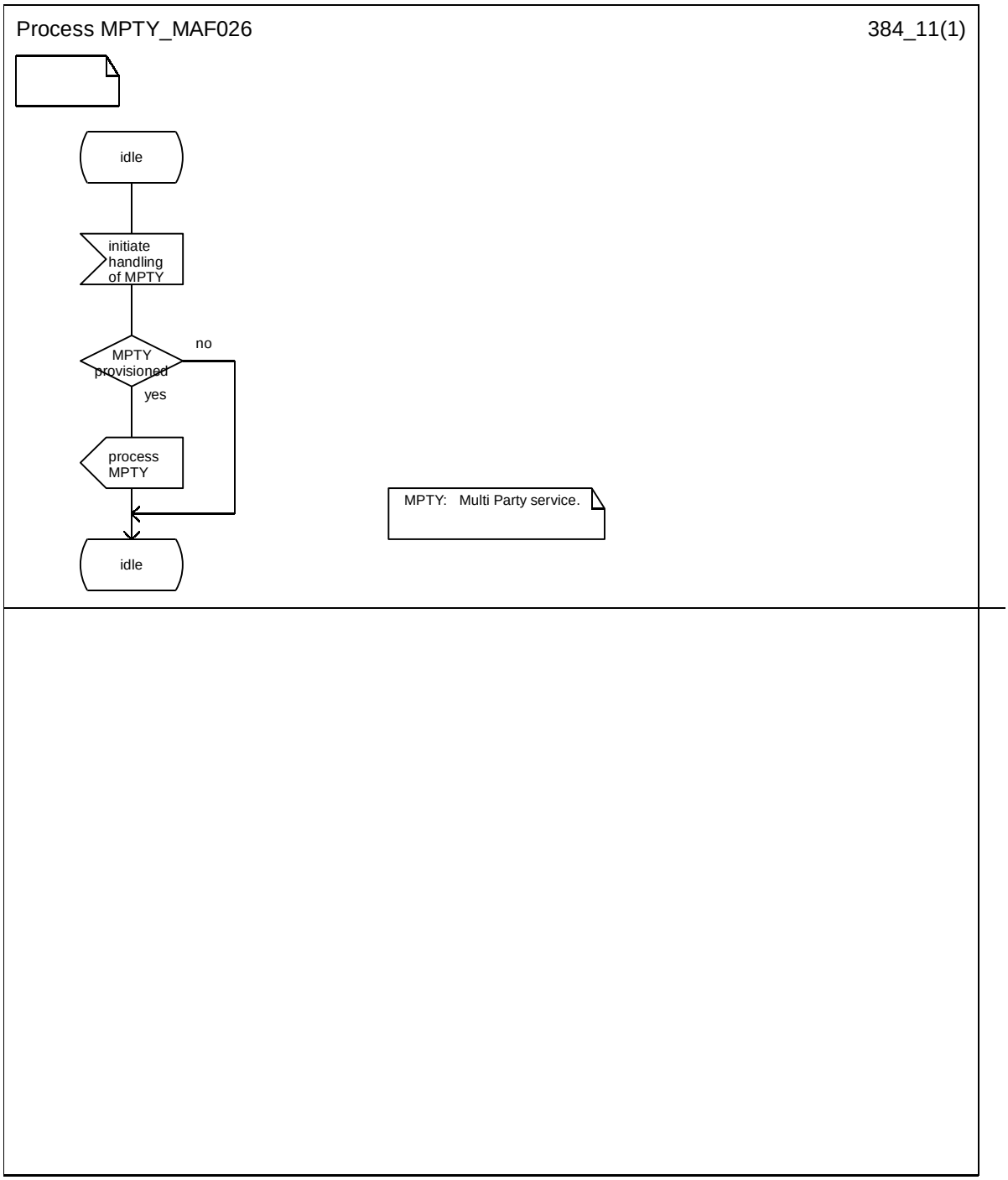
It is assumed that the MPTY ~~Multi Party~~ bridge is located in the MSC.

~~In the SDL diagrams a two dimensional state in conjunction with call hold is used: (active,hold request).~~

- ~~The first dimension is a normal basic call state "active".~~
- ~~The second dimension is "hold request" (abbreviated hold req) meaning that a request has been made for the hold function.~~

To avoid having two calls on hold at the same time the reception of the retrieve request is supervised by a retriever timer T as defined in TS 23.083.

Note that while the MPTY ~~Multi Party~~ is on hold, the remote parties can continue to communicate with each other.


Process MPTY_MAF026
384_11(1)
idle
initiate handling of MPTY
MPTY provisioned
no
yes
process MPTY
idle
MPTY: Multi Party service.

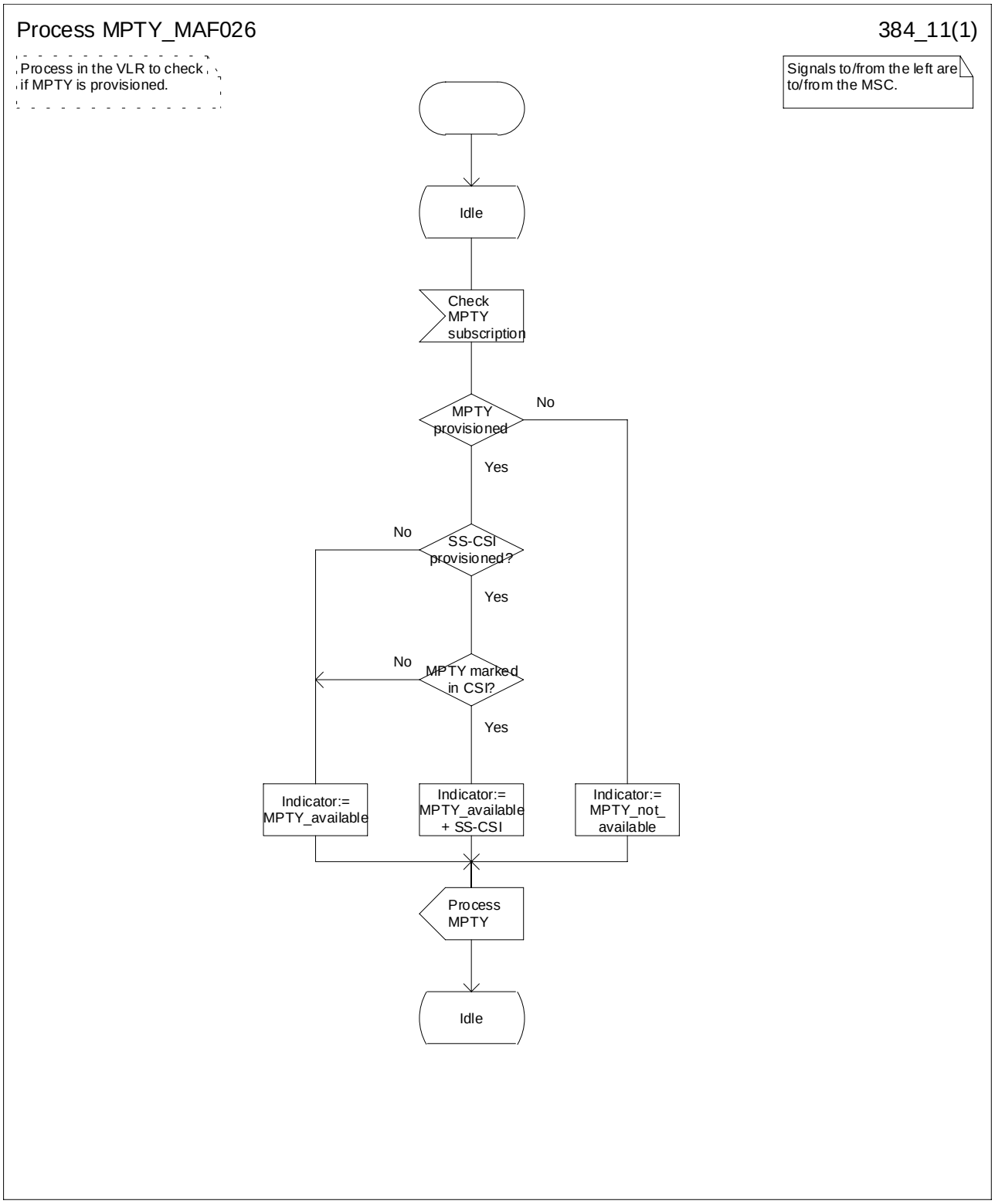
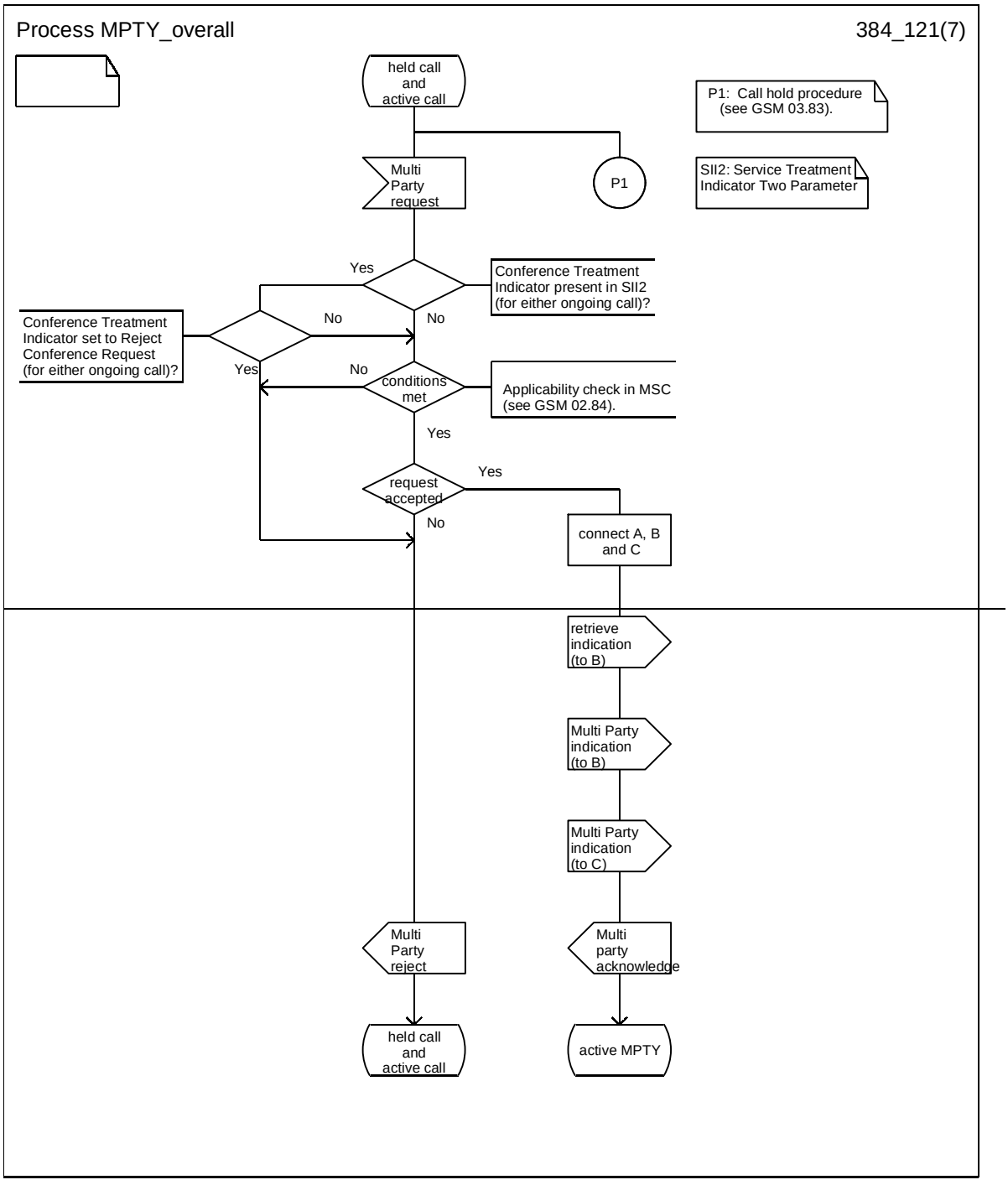


Figure 1.1: MAF026 Multi Party service related authorisations examination (VLR)


Process MPTY_overall
384_121(7)
held call and active call
P1: Call hold procedure (see GSM 03.83).
Multi Party request
P1
SII2: Service Treatment Indicator Two Parameter
Yes
Conference Treatment Indicator present in SII2 (for either ongoing call)?
No
No
Conference Treatment Indicator set to Reject Conference Request (for either ongoing call)?
Yes
No
conditions met
Applicability check in MSC (see GSM 02.84).
Yes
request accepted
Yes
No
connect A, B and C
retrieve indication (to B)
Multi Party indication (to B)
Multi Party indication (to C)
Multi Party reject
Multi party acknowledge
held call and active call
active MPTY

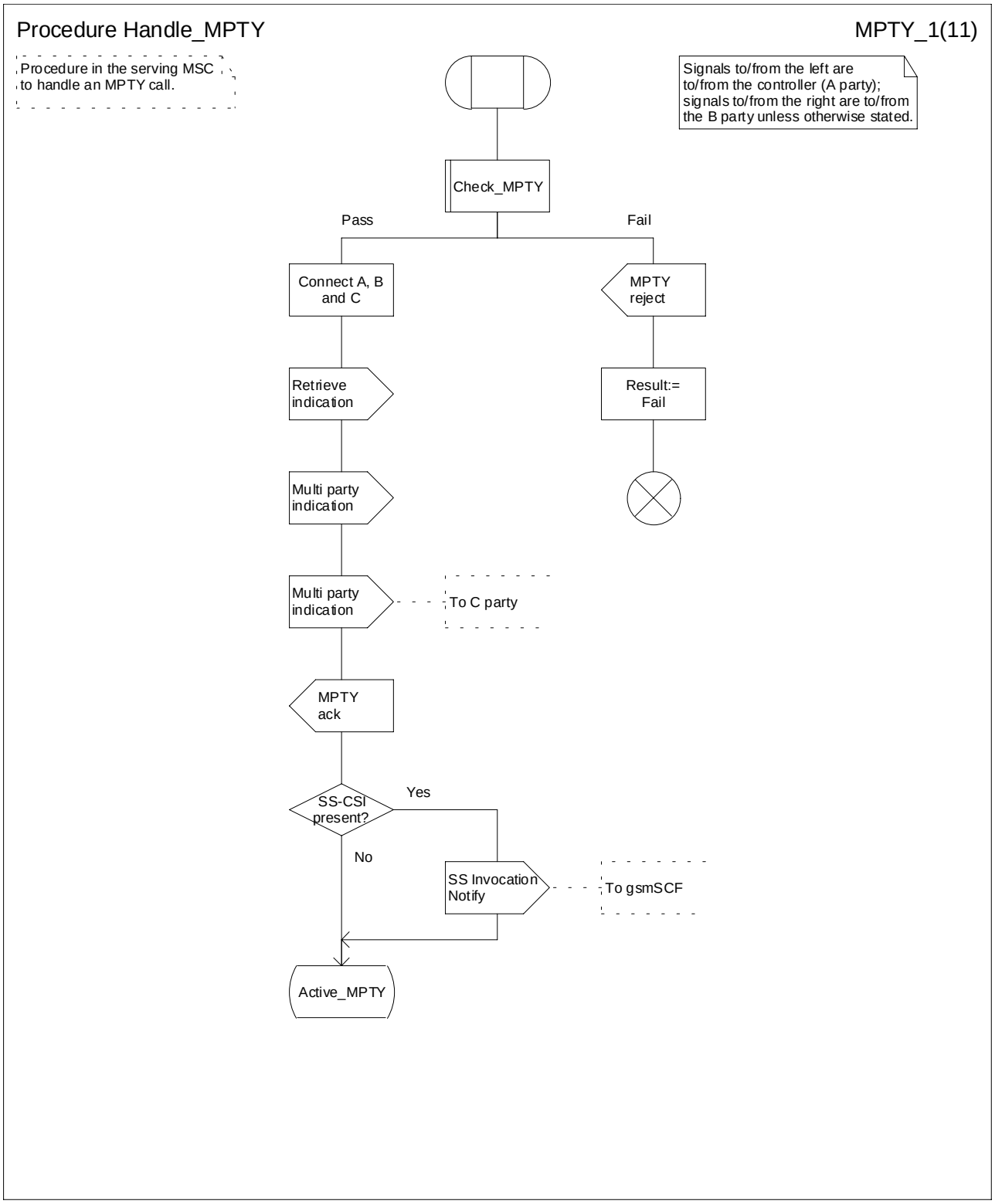
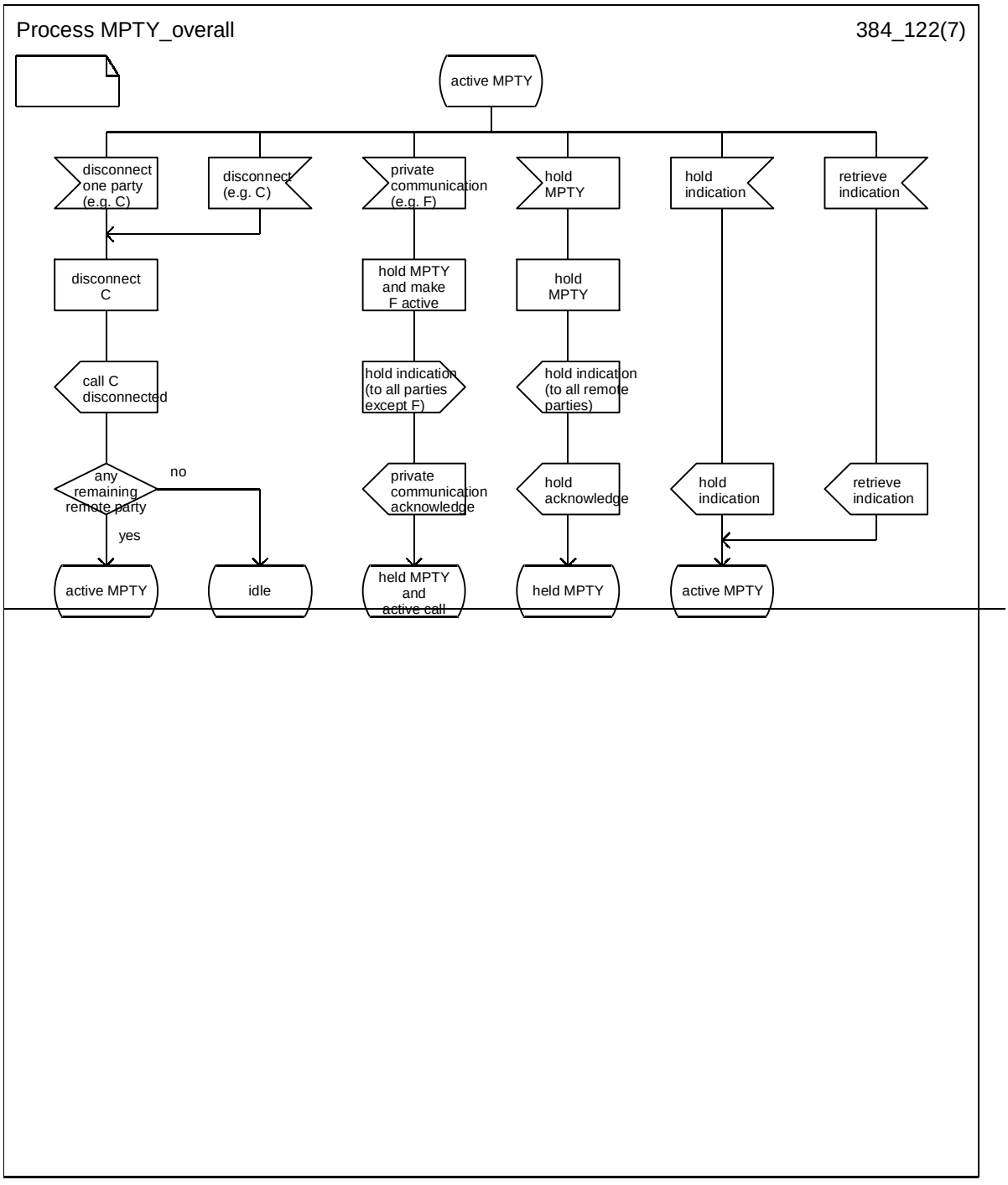


Figure 1.2 (sheet 1 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~


Process MPTY_overall
384_122(7)
active MPTY
disconnect one party (e.g. C)
disconnect (e.g. C)
private communication (e.g. F)
hold MPTY
hold indication
retrieve indication
disconnect C
hold MPTY and make F active
hold MPTY
call C disconnected
hold indication (to all parties except F)
hold indication (to all remote parties)
any remaining remote party
no
yes
private communication acknowledge
hold acknowledge
hold indication
retrieve indication
active MPTY
idle
held MPTY and active call
held MPTY
active MPTY

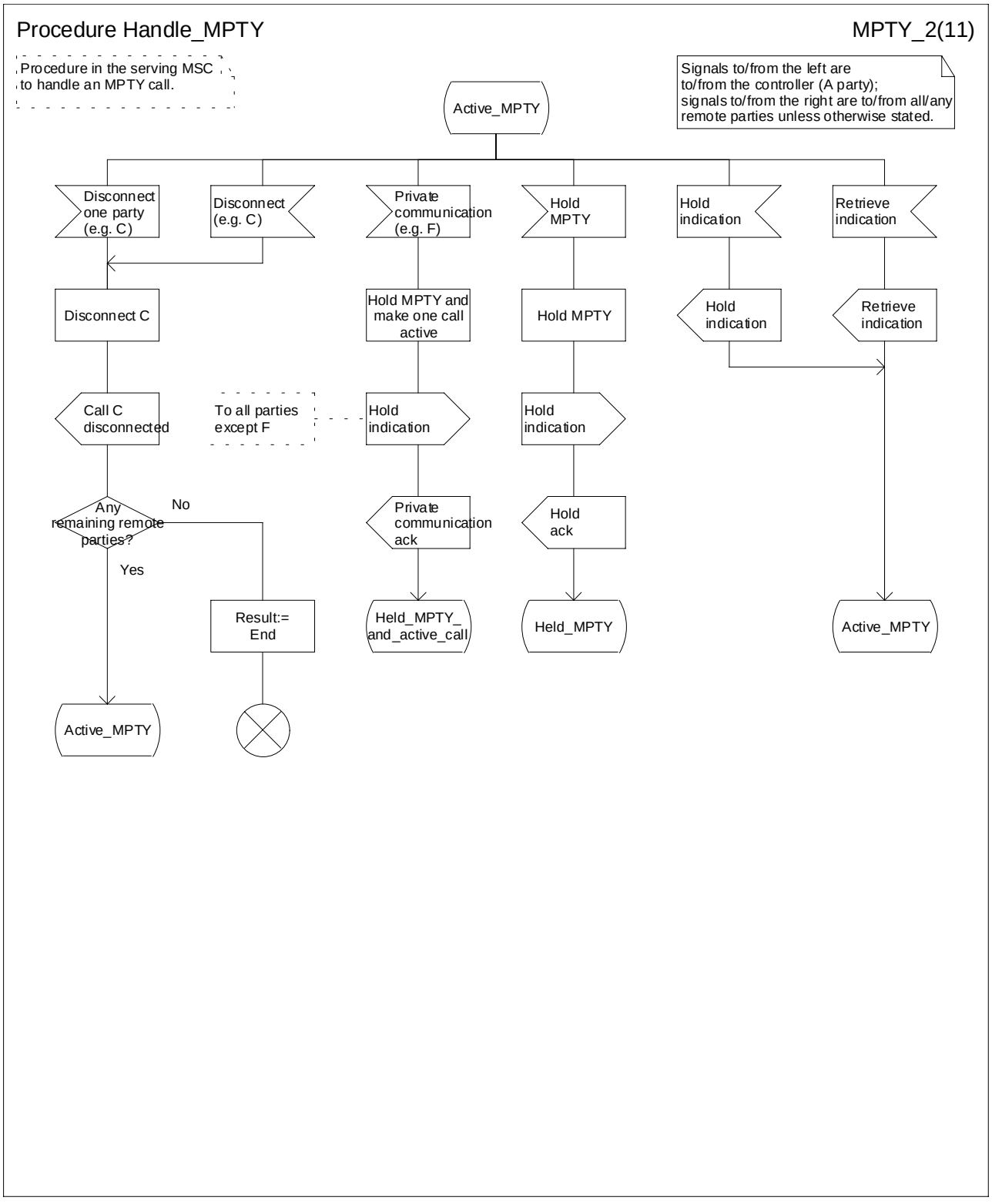
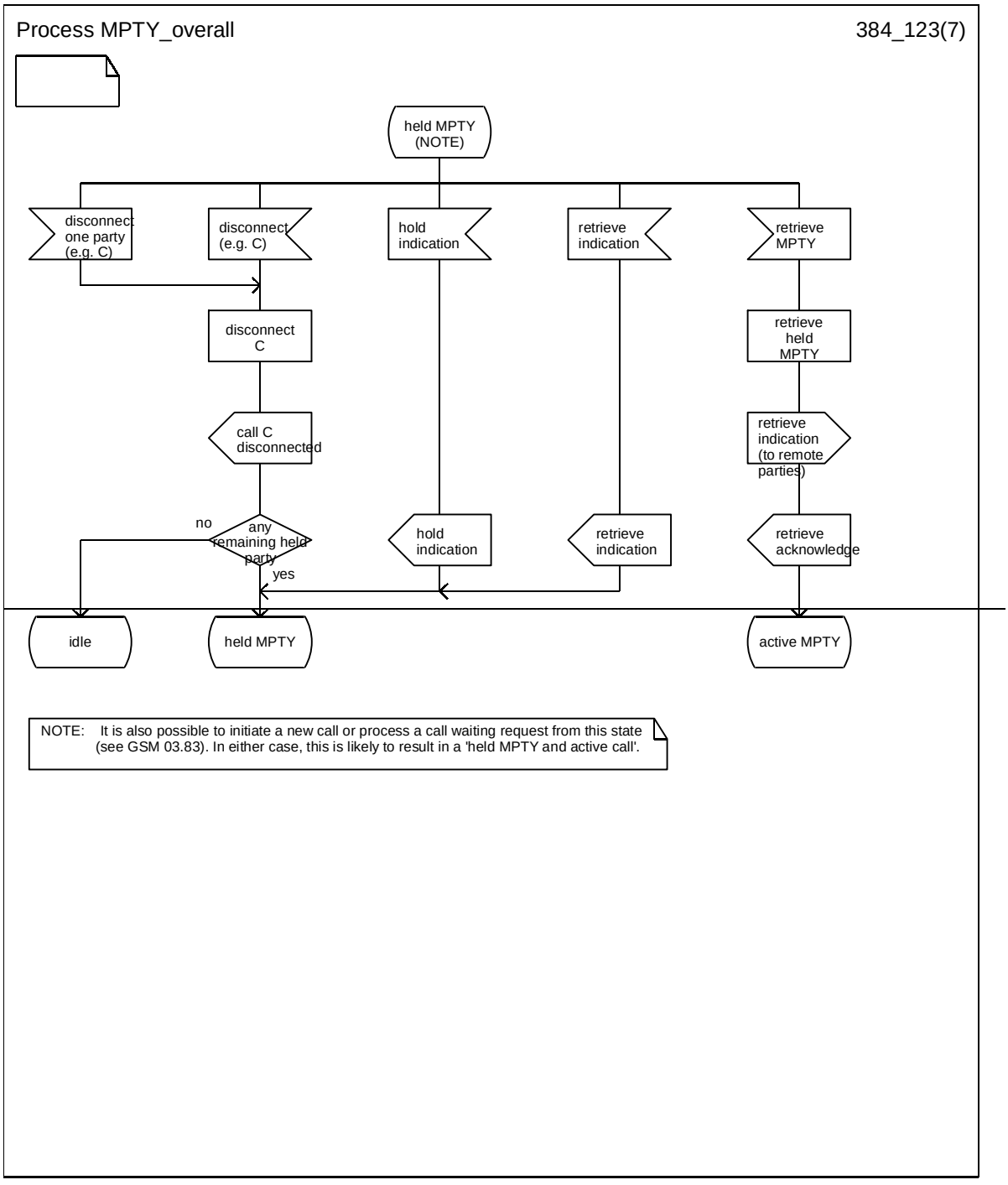


Figure 1.2 (sheet 2 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~


Process MPTY_overall
384_123(7)
held MPTY (NOTE)
disconnect one party (e.g. C)
disconnect (e.g. C)
hold indication
retrieve indication
retrieve MPTY
disconnect C
retrieve held MPTY
call C disconnected
retrieve indication (to remote parties)
no
any remaining held party
yes
hold indication
retrieve indication
retrieve acknowledge
idle
held MPTY
active MPTY
NOTE: It is also possible to initiate a new call or process a call waiting request from this state (see GSM 03.83). In either case, this is likely to result in a 'held MPTY and active call'.

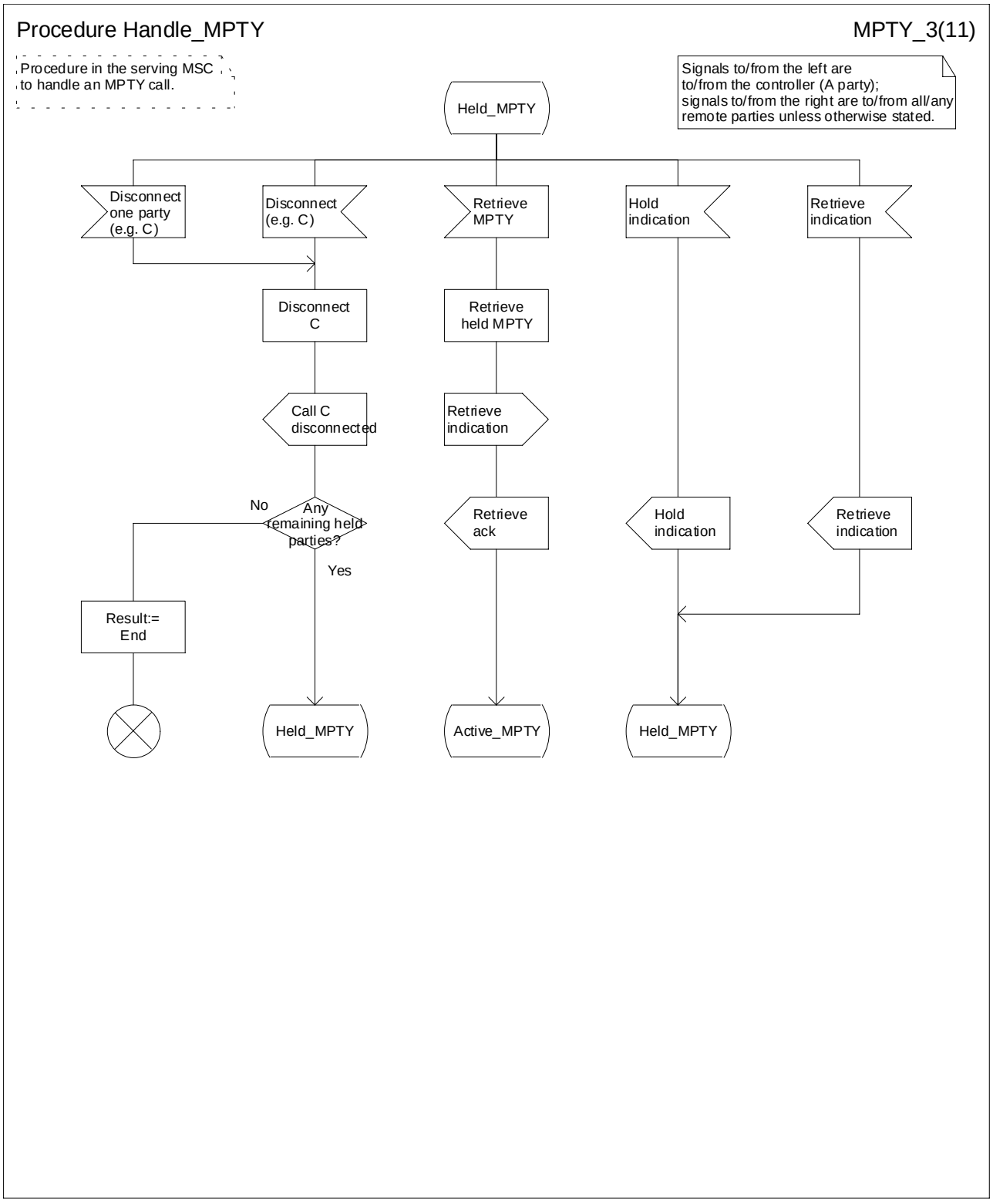
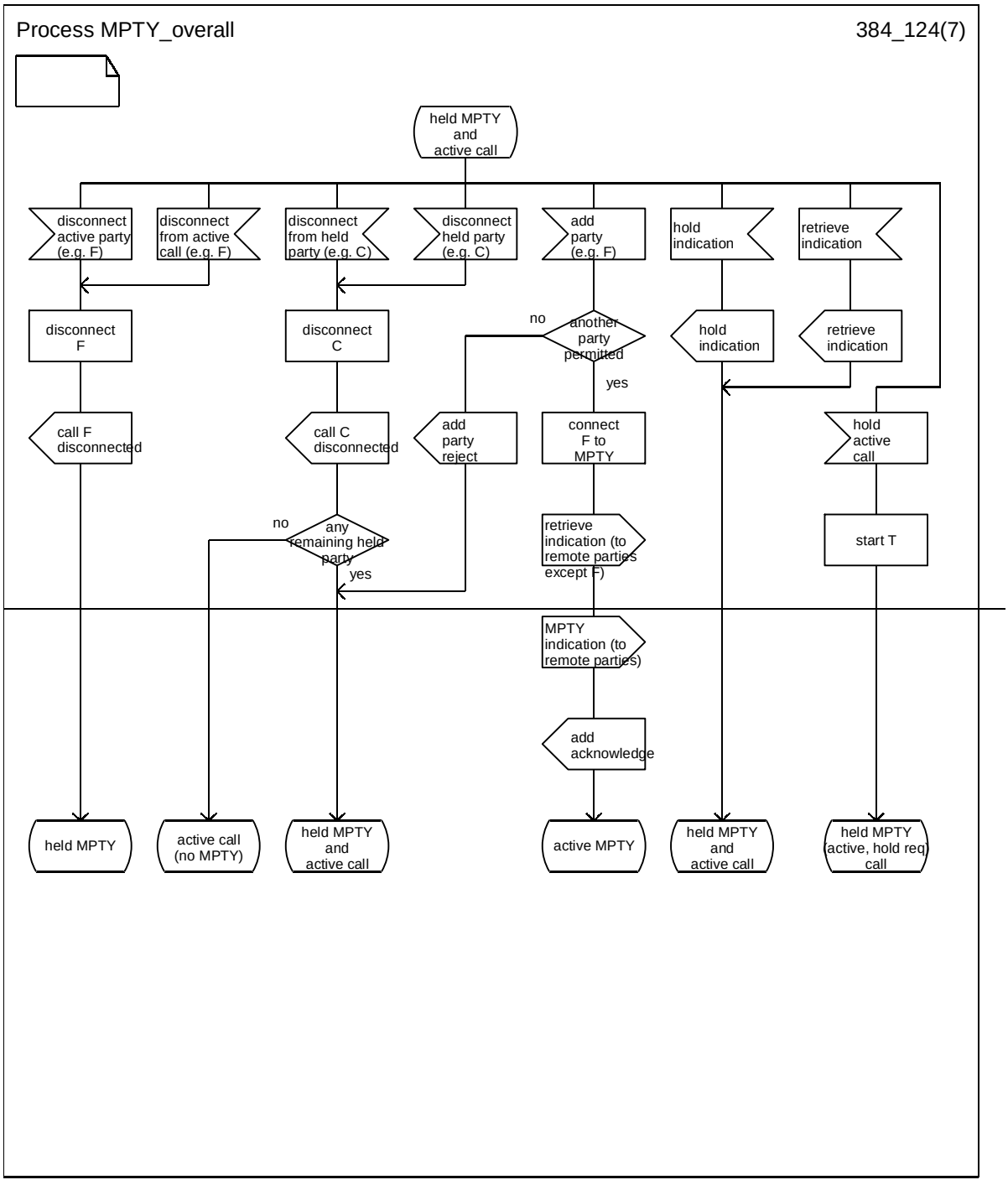


Figure 1.2 (sheet 3 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~


Process MPTY_overall
384_124(7)
held MPTY and active call
disconnect active party (e.g. F)
disconnect from active call (e.g. F)
disconnect from held party (e.g. C)
disconnect held party (e.g. C)
add party (e.g. F)
hold indication
retrieve indication
disconnect F
disconnect C
no
another party permitted
yes
hold indication
retrieve indication
call F disconnected
call C disconnected
add party reject
connect F to MPTY
hold active call
no
any remaining held party
yes
retrieve indication (to remote parties except F)
start T
MPTY indication (to remote parties)
add acknowledge
held MPTY
active call (no MPTY)
held MPTY and active call
active MPTY
held MPTY and active call
held MPTY (active, hold req) call

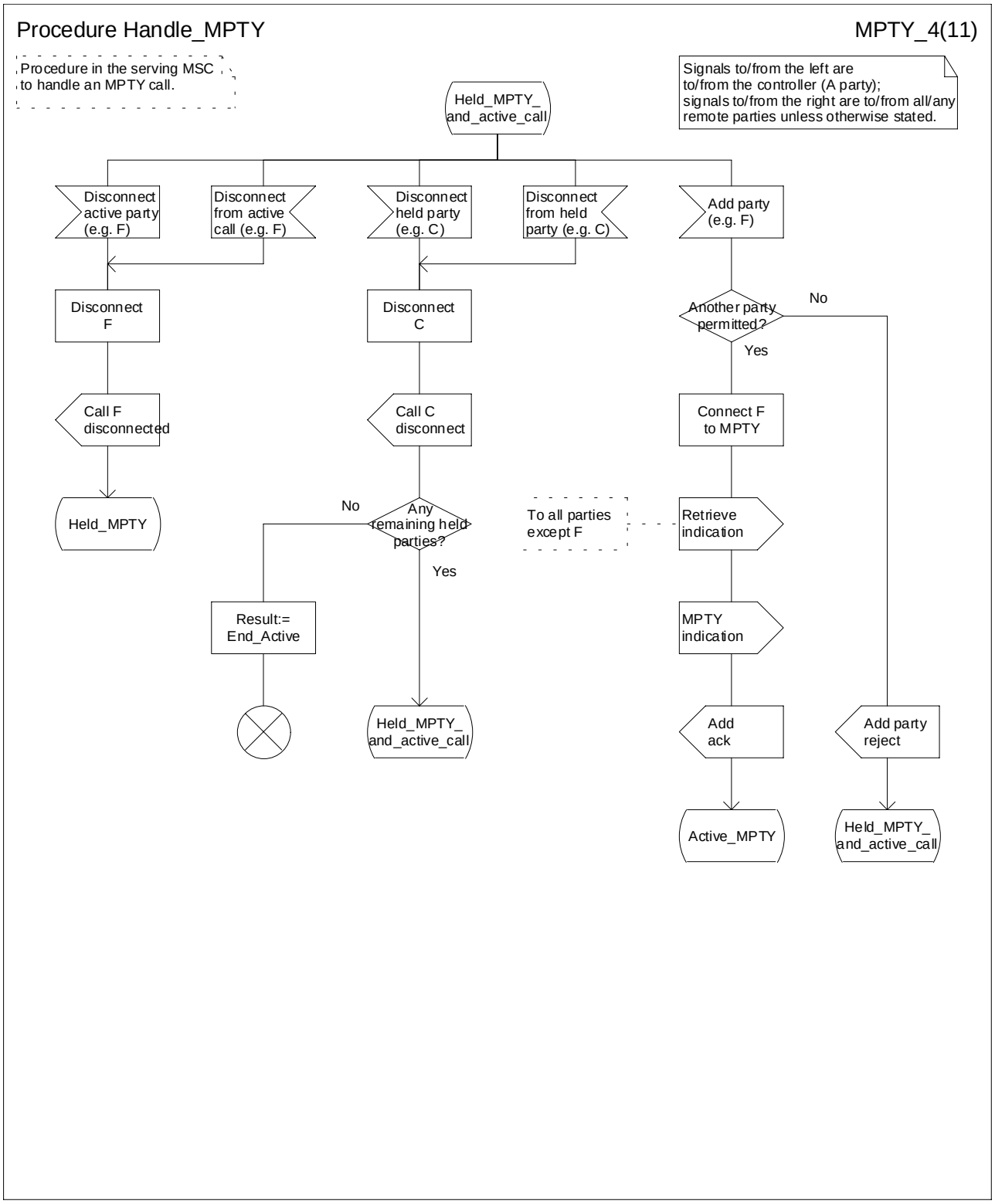
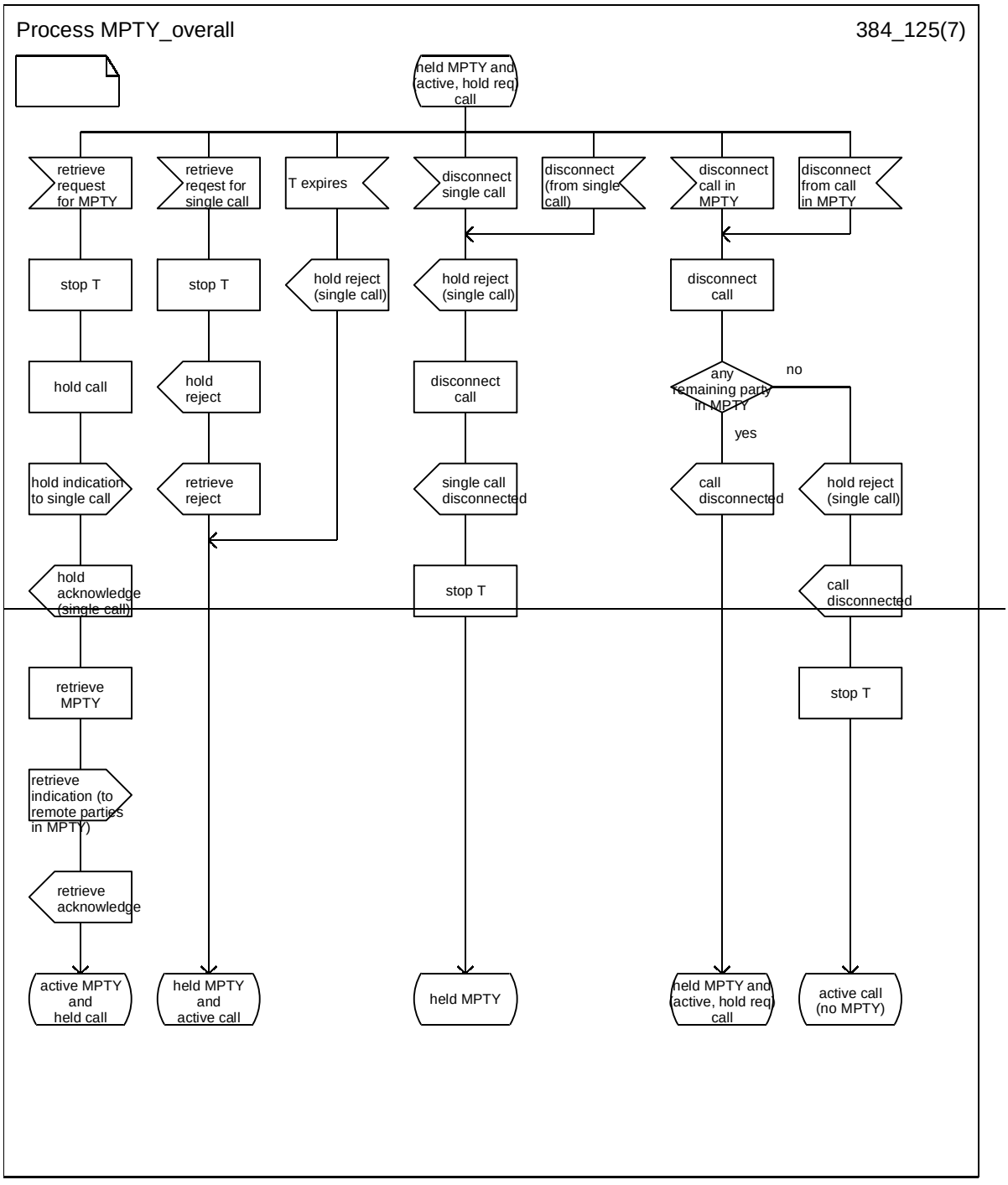


Figure 1.2 (sheet 4 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~


Process MPTY_overall
384_125(7)
held MPTY and active, hold req call
retrieve request for MPTY
retrieve reqest for single call
T expires
disconnect single call
disconnect (from single call)
disconnect call in MPTY
disconnect from call in MPTY
stop T
stop T
hold reject (single call)
hold reject (single call)
disconnect call
hold call
hold reject
disconnect call
any remaining party in MPTY
no
yes
hold indication to single call
retrieve reject
single call disconnected
call disconnected
hold reject (single call)
hold acknowledge (single call)
stop T
call disconnected
retrieve MPTY
stop T
retrieve indication (to remote parties in MPTY)
retrieve acknowledge
active MPTY and held call
held MPTY and active call
held MPTY
held MPTY and active, hold req call
active call (no MPTY)

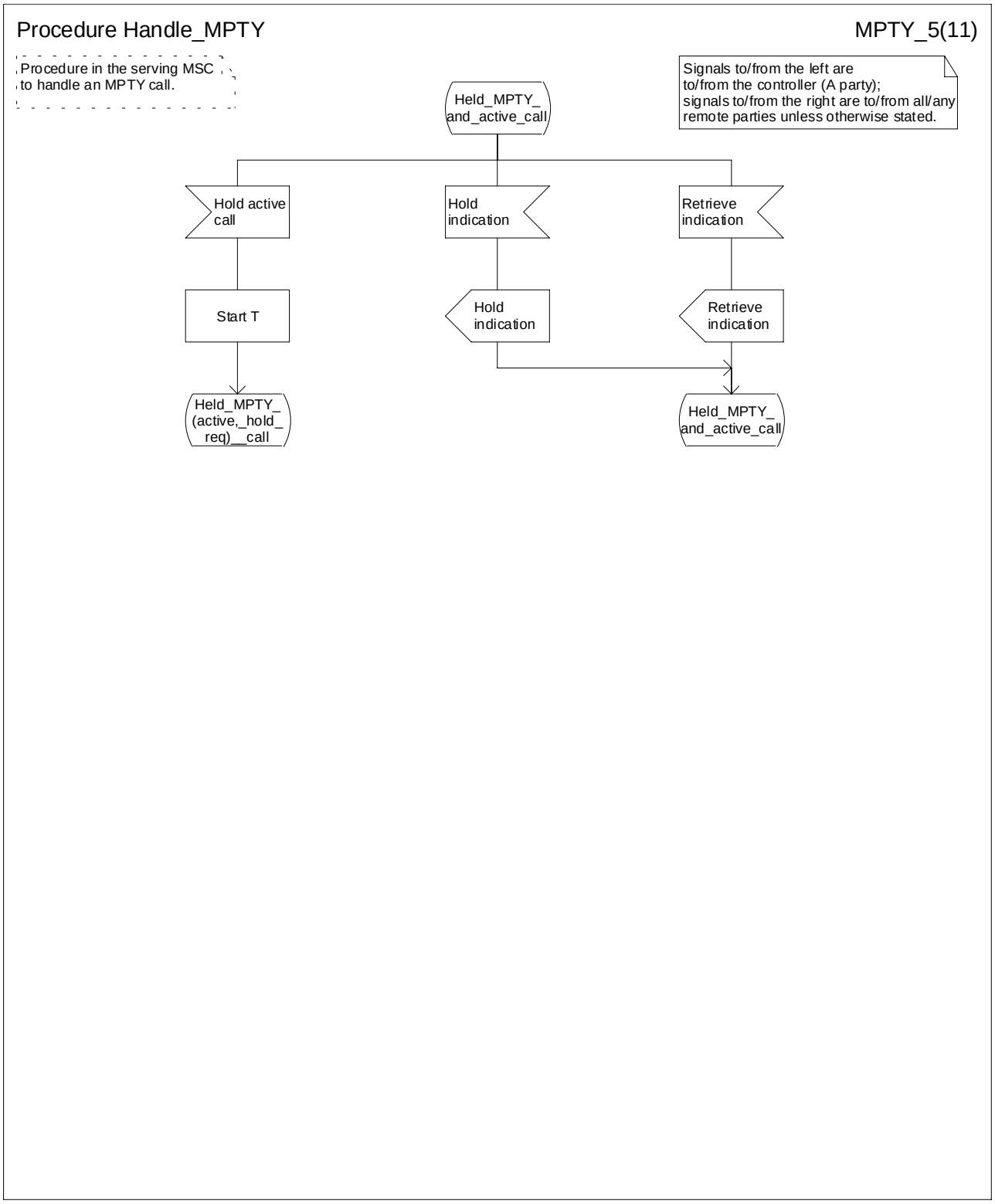
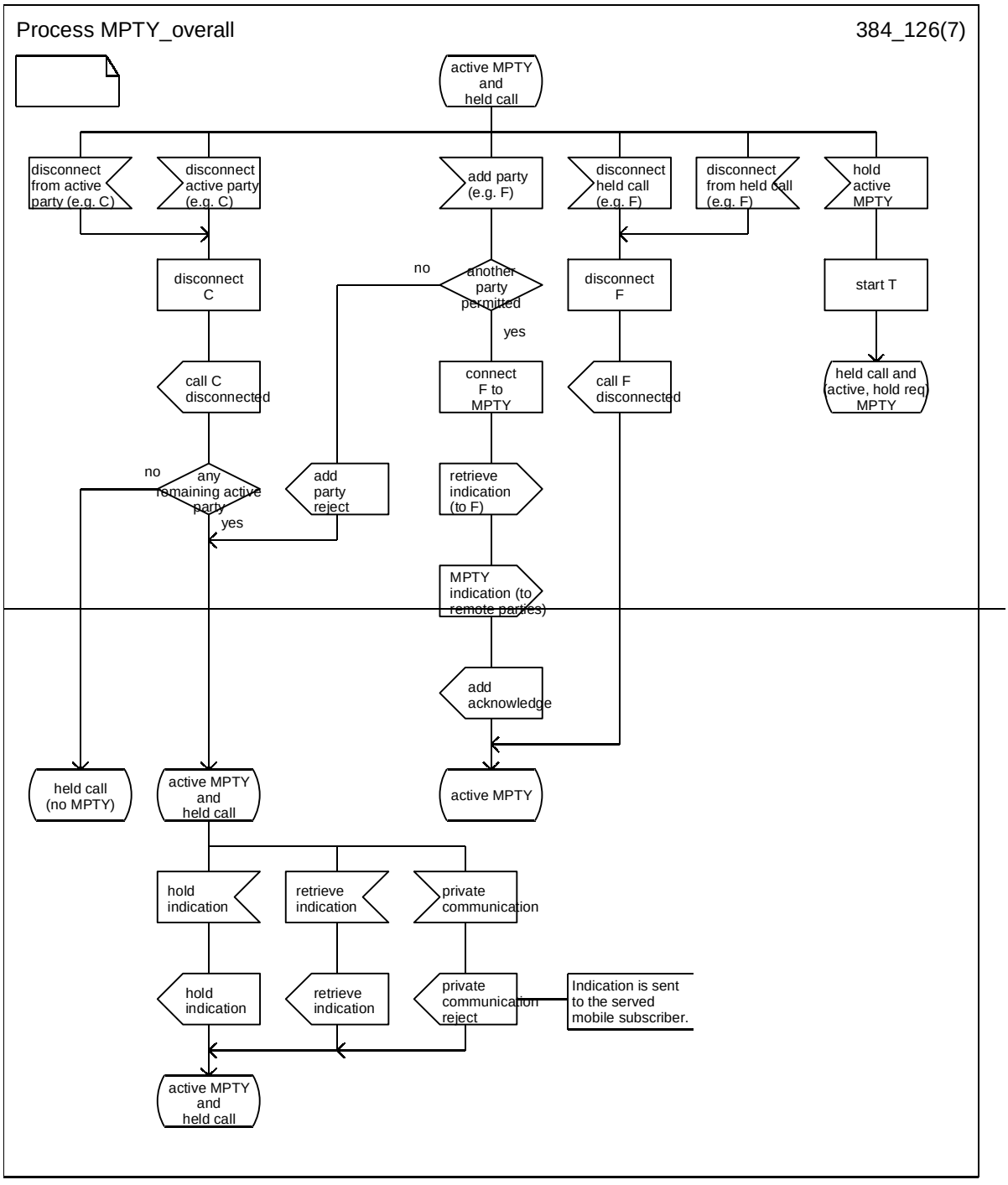


Figure 1.2 (sheet 5 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~


Process MPTY_overall
384_126(7)
active MPTY and held call
disconnect from active party (e.g. C)
disconnect active party (e.g. C)
add party (e.g. F)
disconnect held call (e.g. F)
disconnect from held call (e.g. F)
hold active MPTY
disconnect C
no
another party permitted
disconnect F
start T
yes
call C disconnected
connect F to MPTY
call F disconnected
held call and active, hold req MPTY
no
any remaining active party
add party reject
retrieve indication (to F)
yes
MPTY indication (to remote parties)
add acknowledge
held call (no MPTY)
active MPTY and held call
active MPTY
hold indication
retrieve indication
private communication
hold indication
retrieve indication
private communication reject
Indication is sent to the served mobile subscriber.
active MPTY and held call

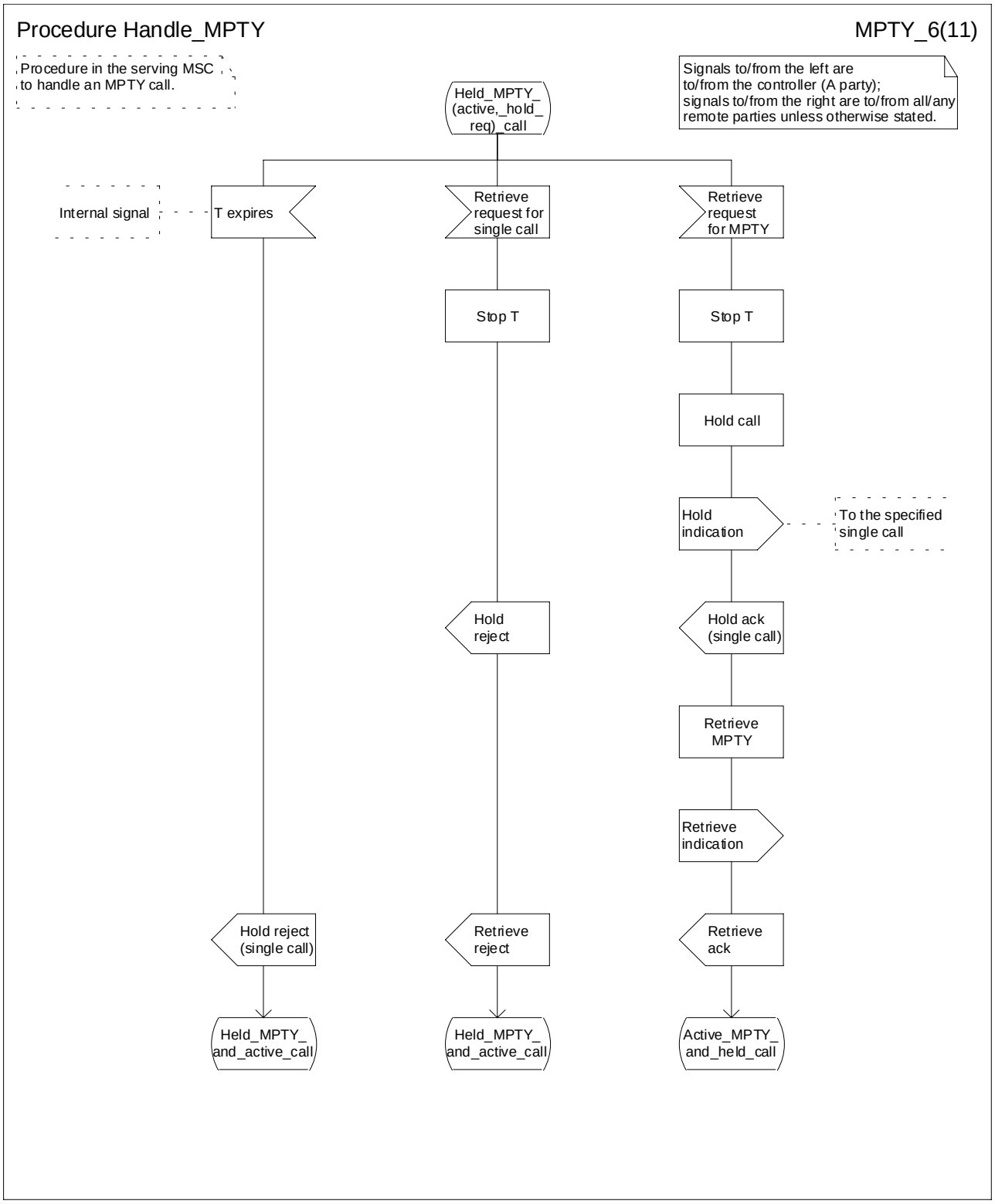
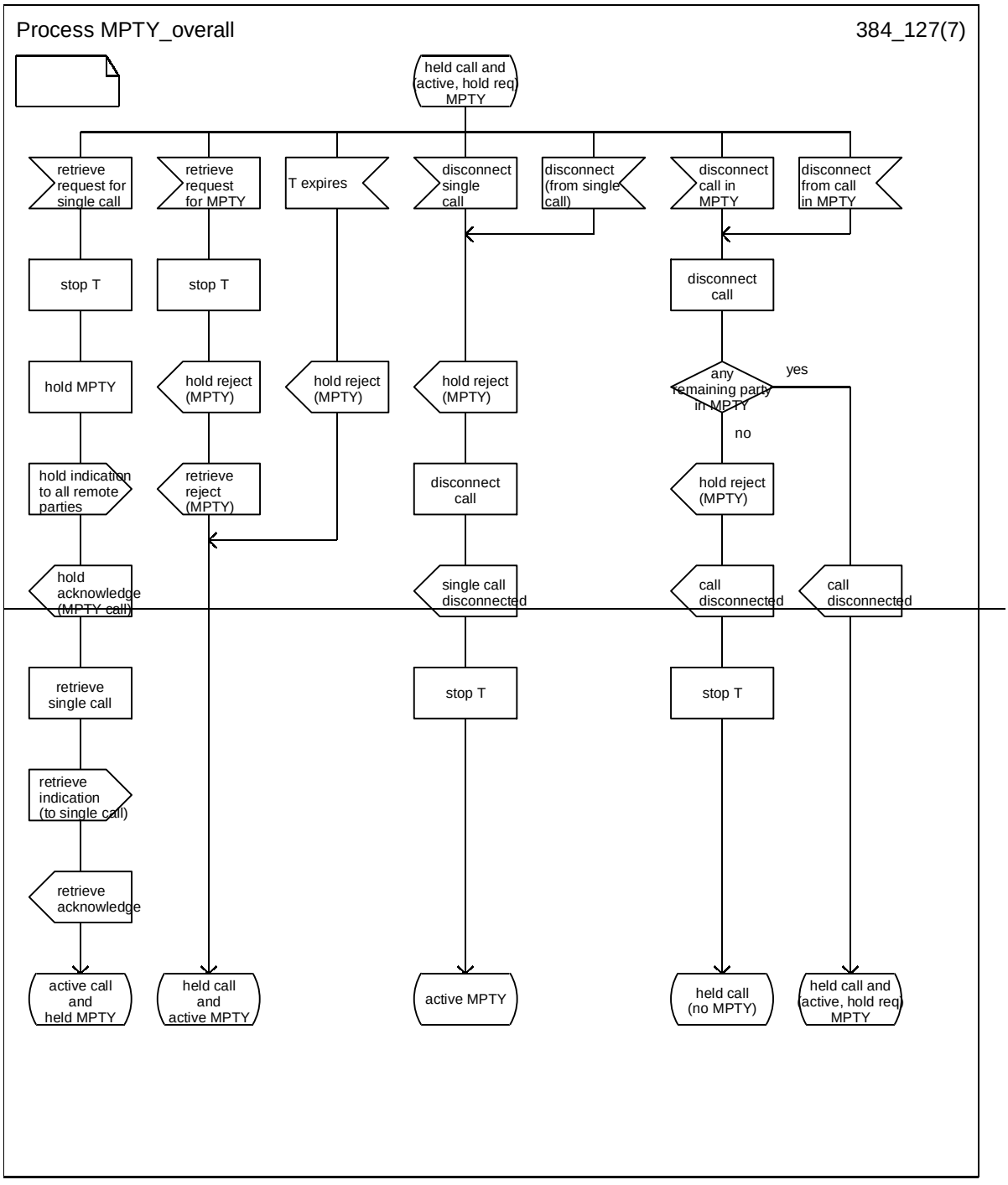


Figure 1.2 (sheet 6 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~


Process MPTY_overall
384_127(7)
held call and active, hold req MPTY
retrieve request for single call
retrieve request for MPTY
T expires
disconnect single call
disconnect (from single call)
disconnect call in MPTY
disconnect from call in MPTY
stop T
stop T
disconnect call
hold MPTY
hold reject (MPTY)
hold reject (MPTY)
hold reject (MPTY)
any remaining party in MPTY
yes
no
hold indication to all remote parties
retrieve reject (MPTY)
disconnect call
hold reject (MPTY)
hold acknowledge (MPTY call)
single call disconnected
call disconnected
call disconnected
retrieve single call
stop T
stop T
retrieve indication (to single call)
retrieve acknowledge
active call and held MPTY
held call and active MPTY
active MPTY
held call (no MPTY)
held call and active, hold req MPTY

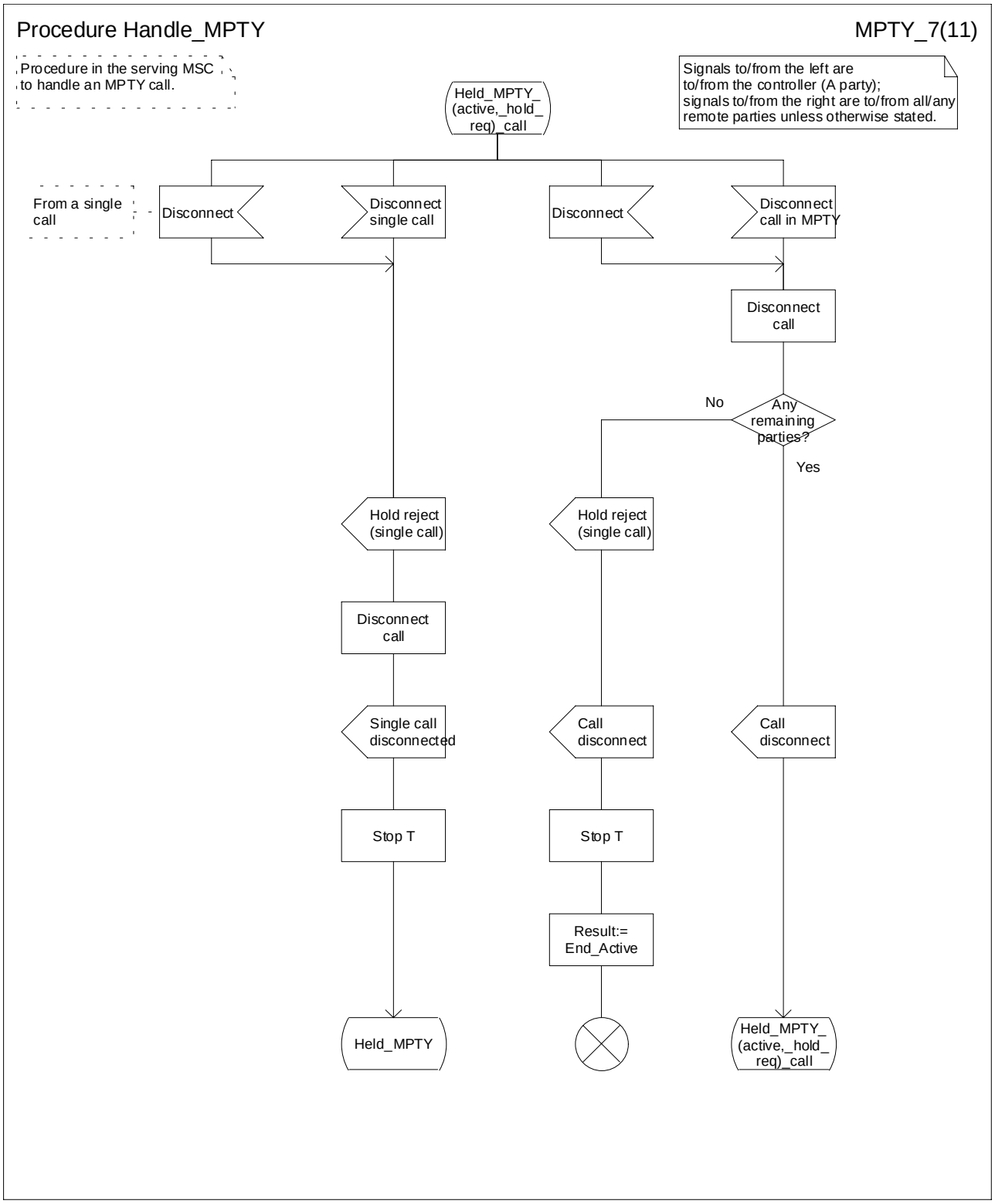


Figure 1.2 (sheet 7 of 11~~7~~): Procedure Handle_MPTY~~Overall SDL diagram of Multi Party service~~

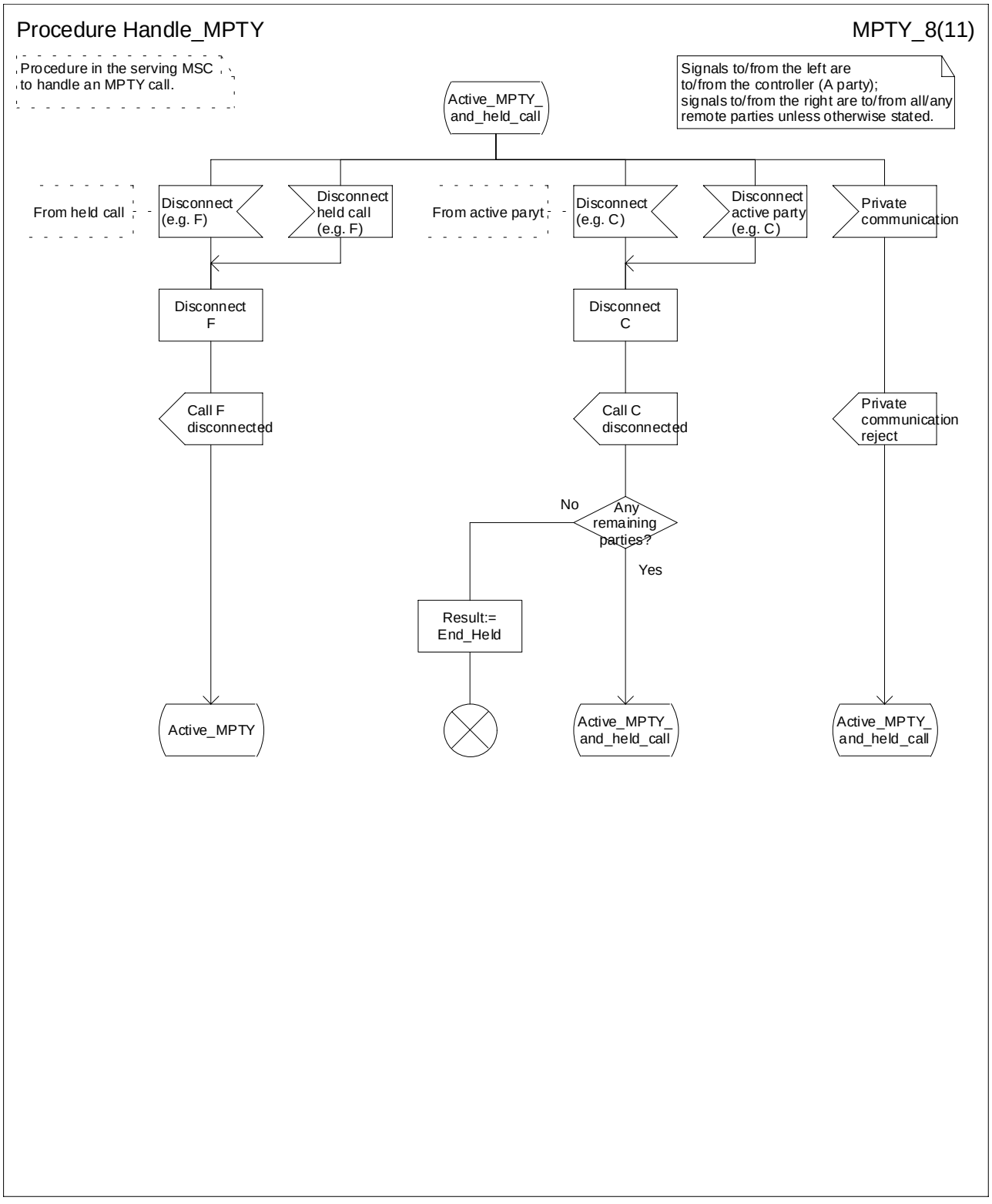


Figure 1.2 (sheet 8 of 11): Procedure Handle_MPTY

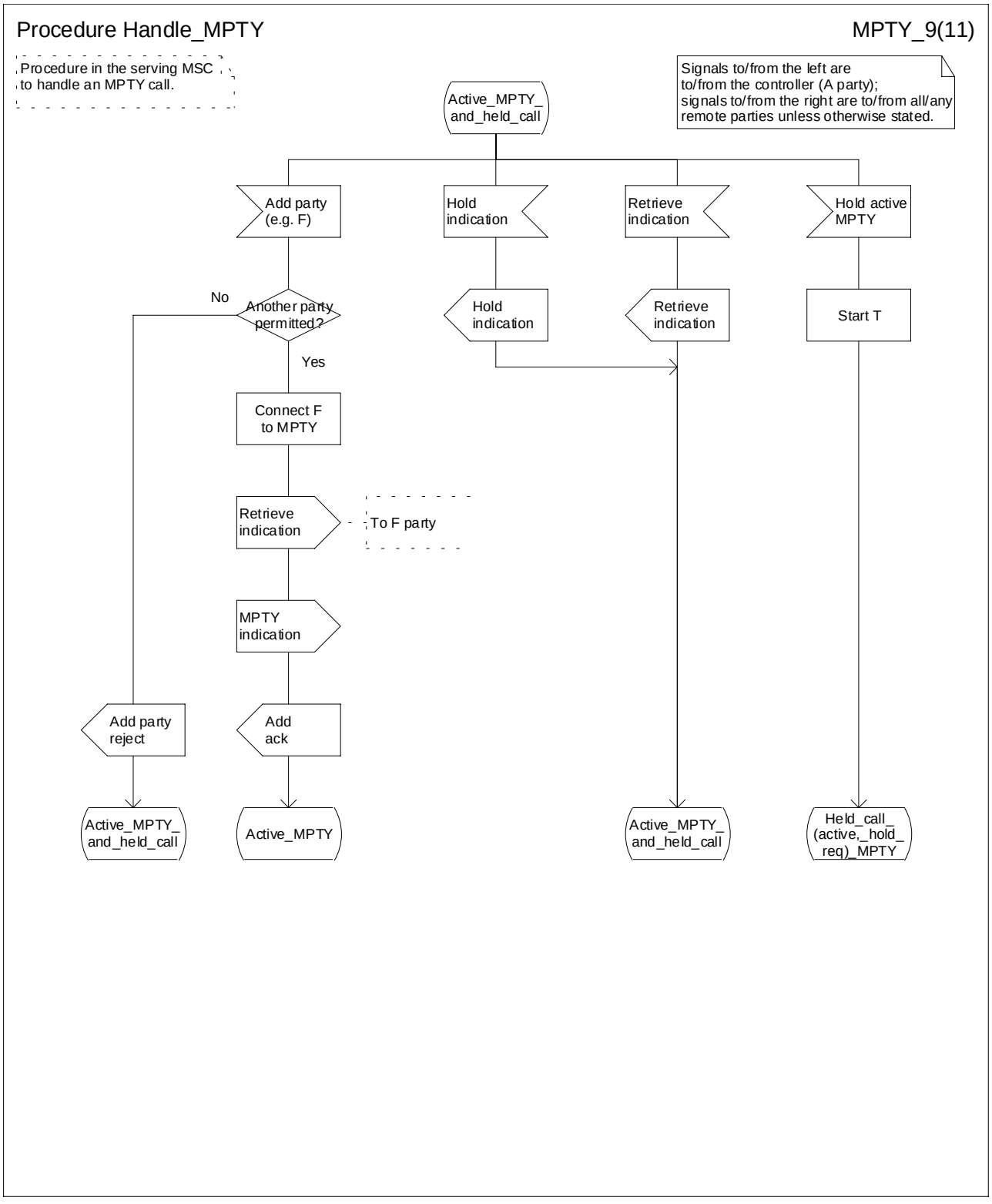


Figure 1.2 (sheet 9 of 11): Procedure Handle_MPTY

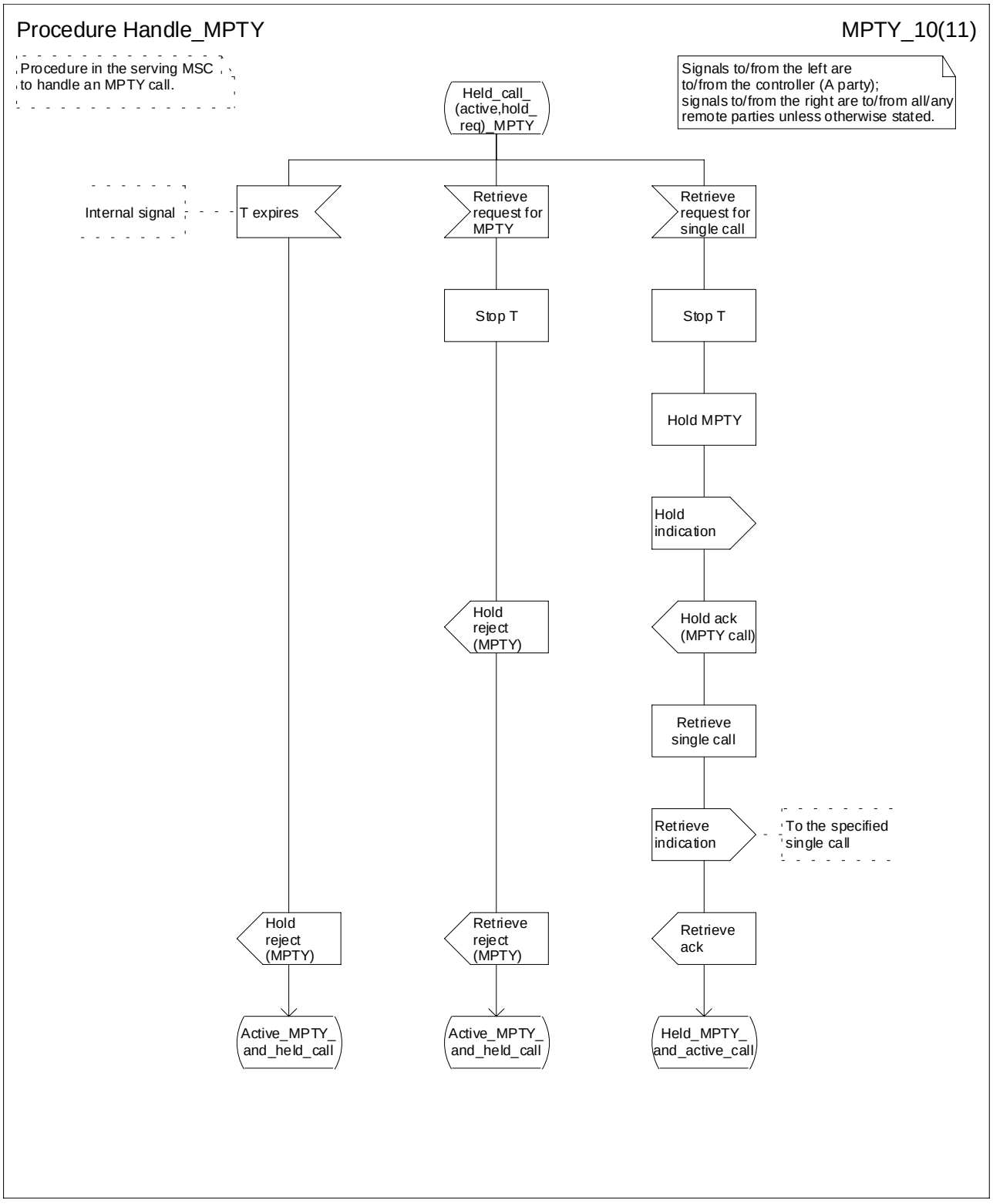


Figure 1.2 (sheet 10 of 11): Procedure Handle_MPTY

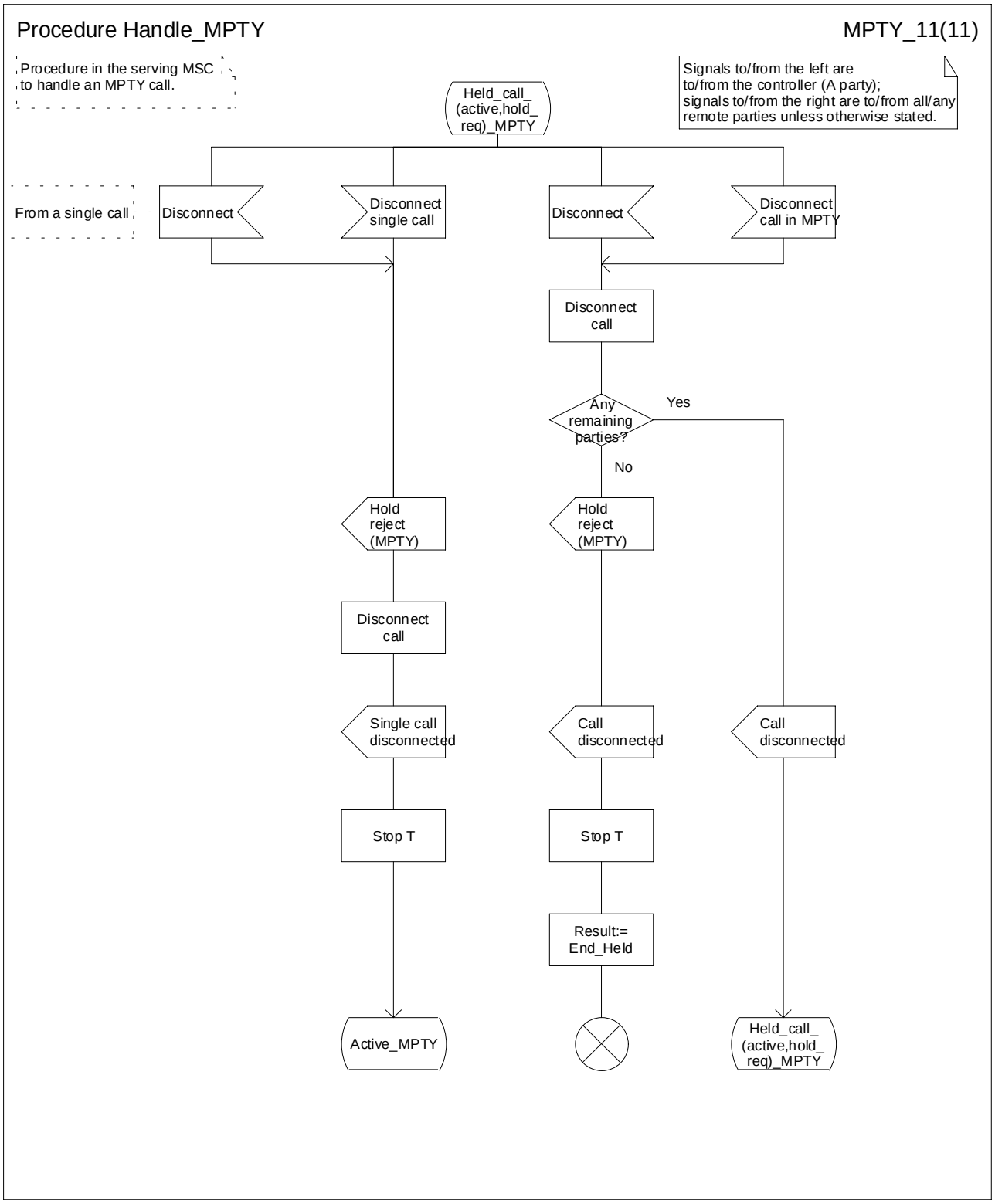


Figure 1.2 (sheet 11 of 11): Procedure Handle_MPTY

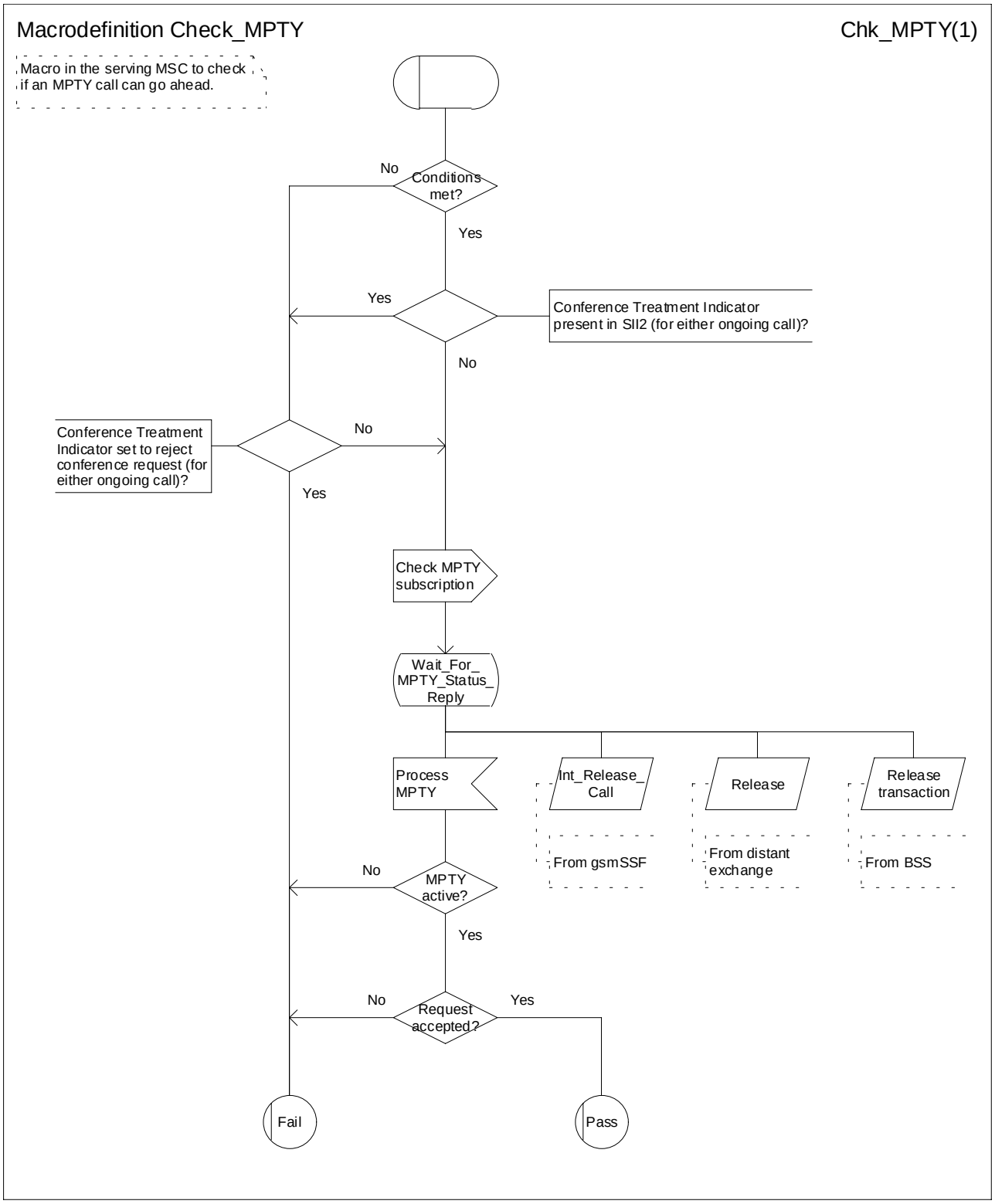


Figure 1.3: Macro Check_MPTY

3GPP TSG-CN4 Meeting #06
Beijing, China, 15-19 Jan 2001

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CR-Form-v3

CHANGE REQUEST

⌘ **23.091** **CR** **003** ⌘ rev **-** ⌘ Current version: **3.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Enhancement of ECT SDLs and CAMEL functionality.
Source:	⌘	CN4
Work item code:	⌘	TEI
Date:	⌘	4/12/00
Category:	⌘	**C**
Release:	⌘	REL-4

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

Use one of the following releases:

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

Reason for change:	⌘	Upon integrating ECT into the Subs_FSM process in 3G TS 23.018, it is necessary to convert the original “overall” SDLs into a proper Procedure. Also, alignment with 23.078 (CAMEL) is needed.
Summary of change:	⌘	Changed the “overall SDLs” into a proper procedure, added CSI interactions (to align with 23.078) and updated references from GSM documents to 3GPP TSs. Some correcting of references and grammar have also been done.
Consequences if not approved:	⌘	This TS will be out of line with 23.078.

Clauses affected:	⌘	2, 3.2, 4.1, 4.2.1, 4.2.2, 4.2.3, 4.4		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.018, 23.078
Other comments:	⌘			

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

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 3GPP TR 21.905: "3G Vocabulary".

[2] 3GPP TS 23.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".

[3] 3GPP TS 24.008: "Mobile ~~r~~Radio ~~i~~Interface ~~l~~Layer 3 specification; Core Network Protocols - Stage 3".

[4] ~~T/S 22 21 (version 9)~~EN 300 368: "Integrated Services Digital network (ISDN); Explicit Call Transfer (ECT) supplementary service; Functional capabilities and information flows".

[5] ~~DE/SPS-6001.22 (version 9)~~EN 300 356-14: "Integrated Services Digital network (ISDN); ~~Explicit Call Transfer (ECT) supplementary service;~~ Signalling System No. 7; ~~Integrated services digital network User Part (ISUP) protocol~~ ISDN User Part (ISUP) version 3 for the international interface; Part 14: Explicit Call Transfer (ECT) supplementary service".

[6] 3GPP TS 23.011: “Technical realization of Supplementary Services”.

[7] 3GPP TS 23.018: “Basic Call Handling”.

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

3.2 Abbreviations

In addition to those below, abbreviations used in the present document are listed in 3GPP TR 21.905 [1].

ECT:	Explicit Call Transfer supplementary service
LI:	Line Identity
NI:	Notification Indicator
Rdn:	Redirection number
RdnB:	Redirection number of ~~the~~ party B
RdnD:	Redirection number of ~~the~~ party D

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

4 Explicit Call Transfer (ECT)

4.1 Functions

The following function has been identified for the explicit call transfer service:

MAF027

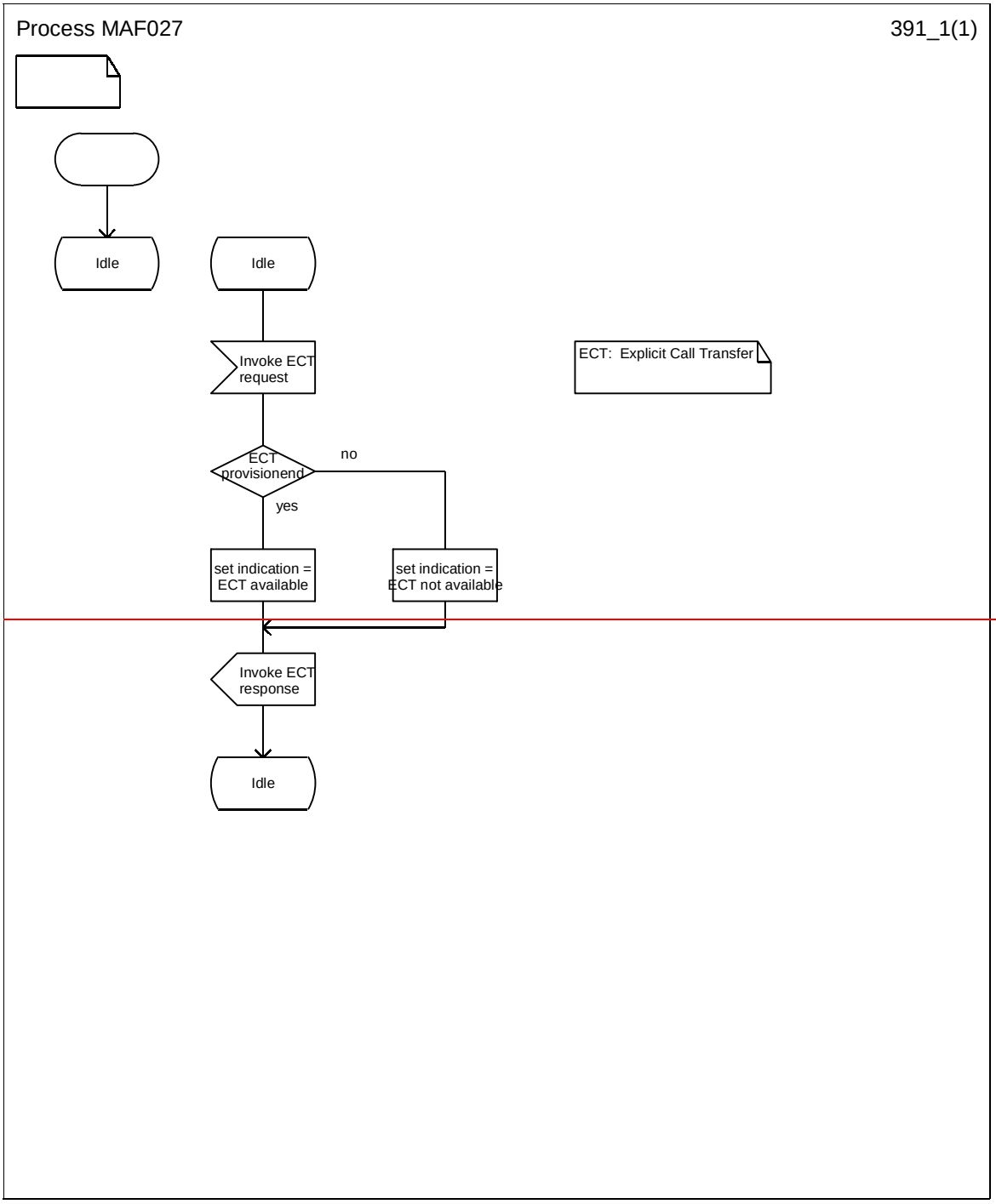
Explicit Call Transfer related authorizations examination

The ability of a PLMN component to determine the authorizations relating to explicit call transfer. See figure 1.

Location: VLR

~~Within the authorization examinations diagram, the messages shown to and from the left are to and from the MSC.~~

~~After receiving a "invoke ECT request" the VLR will check if the Explicit Call Transfer service is provisioned for the served subscriber. If the service is provisioned the VLR send back to the MSC "Explicit Call Transfer available". If the service is not provisioned the VLR will send back to the MSC "Explicit Call Transfer not available". When the response has been sent back to the MSC the process will return to the idle state.~~


Process MAF027
391_1(1)
Idle
Idle
Invoke ECT request
ECT: Explicit Call Transfer
ECT provisionend
no
yes
set indication = ECT available
set indication = ECT not available
Invoke ECT response
Idle

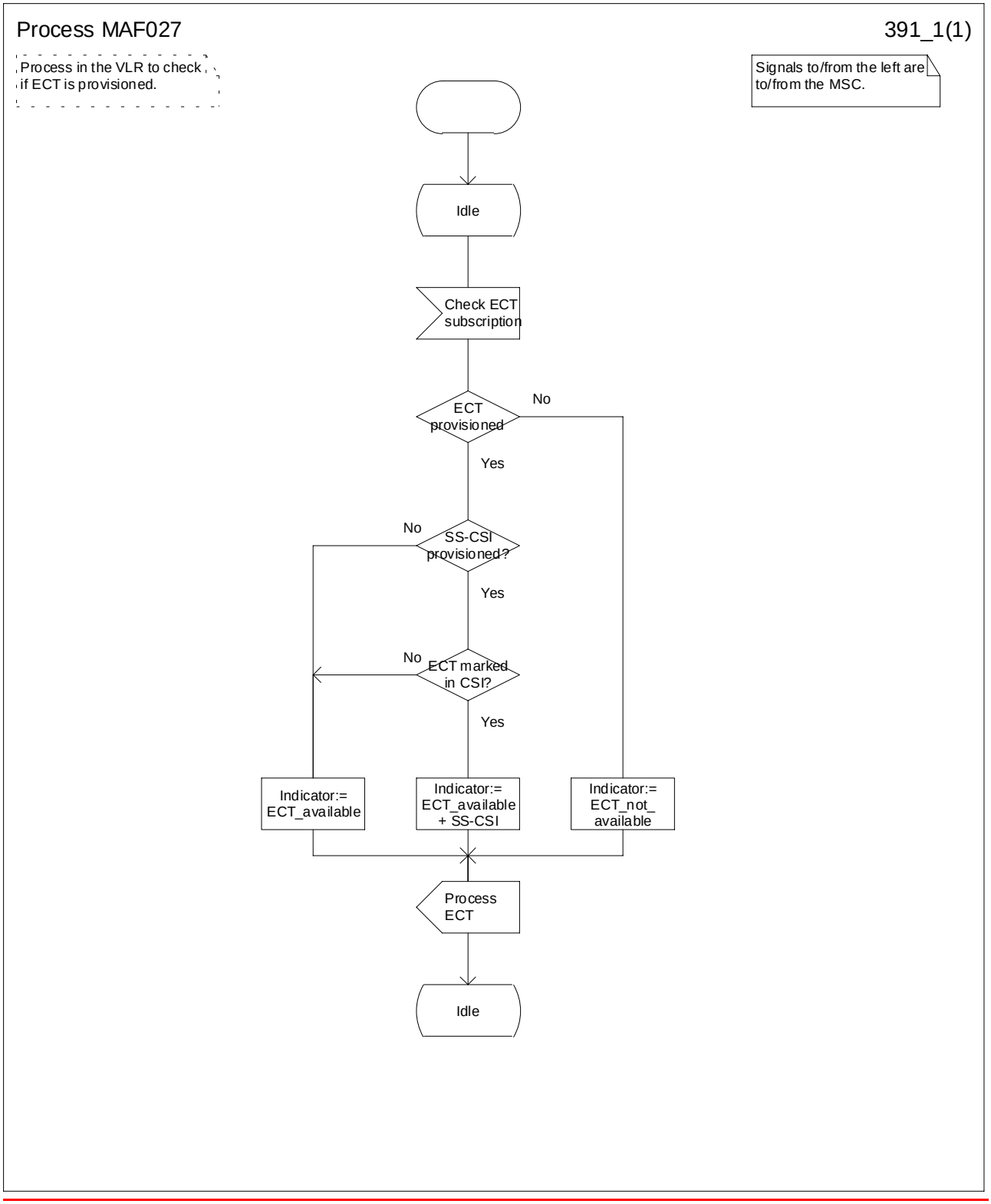


Figure 1: Explicit Call Transfer related authorizations examination (VLR)

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

4.2 ~~Overall~~ SDL~~-~~ diagrams and information flows

4.2.1 General description

~~The overall SDL diagrams represent the network as a whole.~~ The ~~overall SDL diagrams~~ procedures Handle_ECT_Active and Handle_ECT_Alerting show the ~~status~~ behaviour of the service as perceived by the served mobile subscriber~~, as well as the status as perceived~~and by any of the other parties involved in the transfer. ~~Besides this, the overall SDL diagrams~~ These procedures and the macro Check_ECT show the actions to be taken by the network and the information provided by the network to the users.

~~Within the overall SDL-diagrams, messages to and from the served mobile subscriber are indicated to and from the left, whereas messages to and from remote parties are indicated to and from the right.~~

The following states for the invocation of the ECT supplementary service are defined:

a) First Call (Active, Held), Second Call (Active, Idle);

~~b) Second Call (Active, Held), First Call (Active, Idle);~~

~~c~~b) First Call (Active, Held), Second Call (Call Delivered, Idle).

~~These two dimensional states are also used in the SDLs and information flows:~~

~~— the first dimension is a normal basic call state "active" or "call delivered";~~

~~— the second dimension is "held" meaning that the call is set on hold.~~

NOTE: The call state "call delivered" means that an ALERTING message has been sent to ~~received in~~ the MS, but no ANSWER ~~MESSAGE~~ Message (ANM) ~~is~~ has been received.

In the information~~,~~ flows it is assumed that the served subscriber is a mobile subscriber and that the other parties are mobile or fixed subscribers.

Party A is the subscriber controlling the Explicit Call Transfer Call (served mobile subscriber). Party B is the first remote party called. Party C is the second remote party called.

The served party is disconnected by the generic disconnect/release procedure after a successful transfer request. The connection of the remote parties~~y calls~~ in a new call (transferred call) is located in the served subscriber's MSC.

The ~~first figures of the~~ information flows in ~~(~~figures 4 and 7~~)~~ show the unsuccessful case ~~of the transfer request~~ (i.e. the check in the VLR or in the MSC fails).

The information flows in ~~second figures (~~figures 5 and 8~~)~~ show the successful case ~~of the transfer request~~.

4.2.2 ECT (both calls answered)

~~After receipt of a ECT request from the served subscriber, the MSC/VLR will check if the Explicit Call Transfer supplementary service is provisioned for the served subscriber (see also MAF027).~~

~~If the ECT Supplementary Service is provisioned, then the MSC/VLR will check if the transfer is barred by virtue of call states or supplementary service interactions (see also figure 3 and subclause 4.3).~~

~~If there are no such barring causes then the MSC/VLR also checks if CUG restrictions are infringed (see also figure 3 and subclause 4.3).~~

~~If the outcome of these checks are successful and the loop prevention option is supported, an endless loop prevention check shall be performed according to T/S 22 21 (version 9) and DE/SPS6001.22 (version 9).~~

~~If the result of this check is also successful the both calls shall be connected in the MSC (without including the served subscriber in this connection), the held party will be retrieved and both remote parties will be notified that call transfer was done.~~

~~With this notification the both subscribers will be informed about the state of the other remote party in which call transfer was done ("call transferred, active") and if possible about the identity (Redirection number) of each other (for details see also subclause 4.3).~~

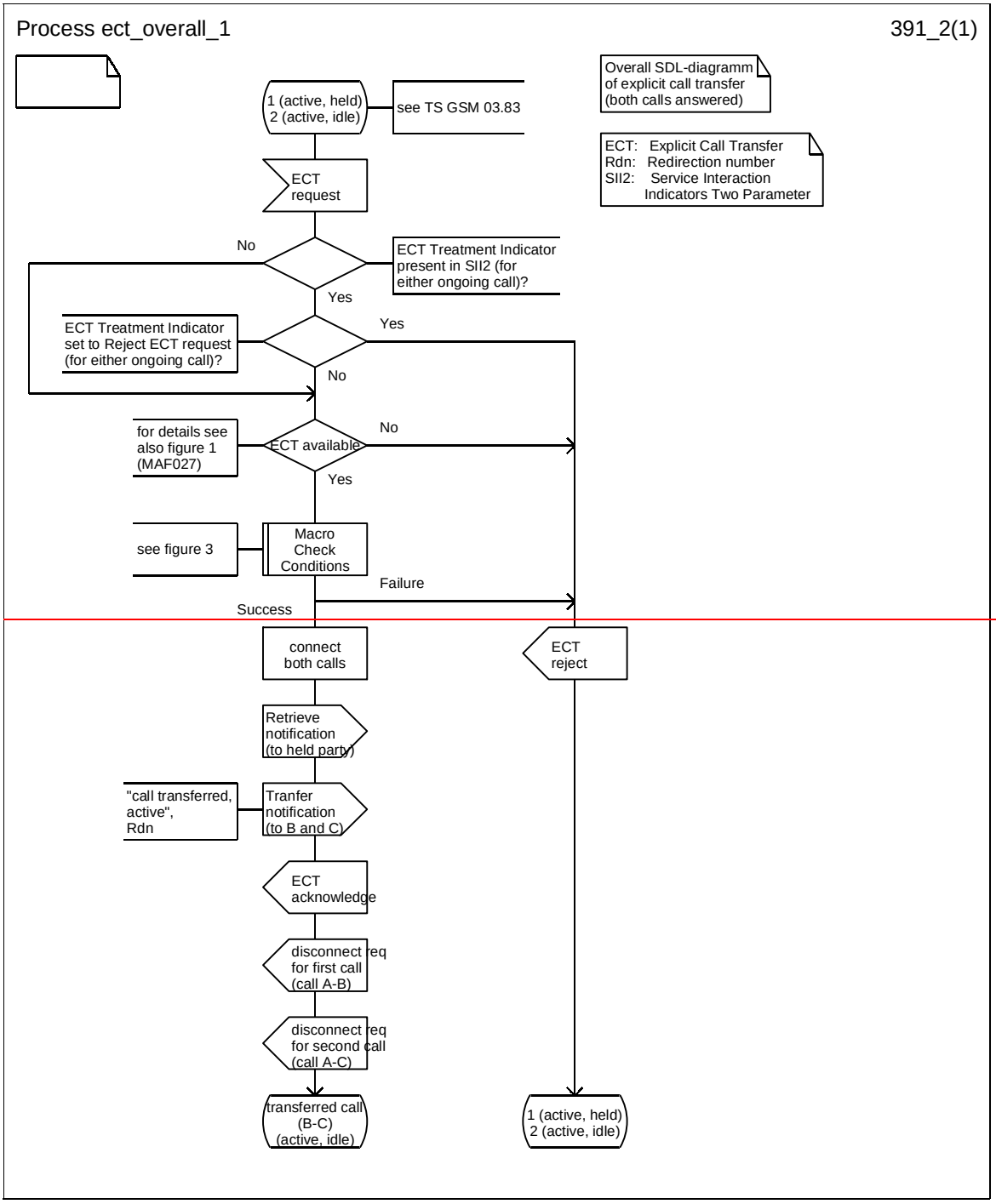
~~After that the served mobile subscriber will be disconnected from both calls.~~

~~If the checks fail the ECT request will be rejected and the two calls remain in the call states in which they were before ECT was attempted.~~

The ~~overall~~ SDL for the procedure Handle_ECT_Active (Explicit Call Transfer - (both calls ~~are~~ have been answered) is shown in figure 2.

The checks ~~if~~ of whether Explicit Call Transfer is barred or not are shown in figure 3.

The corresponding information flows are given in figure 4 and figure 5.


Process ect_overall_1
391_2(1)
1 (active, held)
2 (active, idle)
see TS GSM 03.83
Overall SDL-diagramm
of explicit call transfer
(both calls answered)
ECT: Explicit Call Transfer
Rdn: Redirection number
SII2: Service Interaction
Indicators Two Parameter
ECT
request
No
ECT Treatment Indicator
present in SII2 (for
either ongoing call)?
Yes
ECT Treatment Indicator
set to Reject ECT request
(for either ongoing call)?
Yes
No
for details see
also figure 1
(MAF027)
ECT available
No
Yes
see figure 3
Macro
Check
Conditions
Failure
Success
connect
both calls
ECT
reject
Retrieve
notification
(to held party)
"call transferred,
active",
Rdn
Tranfer
notification
(to B and C)
ECT
acknowledge
disconnect req
for first call
(call A-B)
disconnect req
for second call
(call A-C)
transferred call
(B-C)
(active, idle)
1 (active, held)
2 (active, idle)

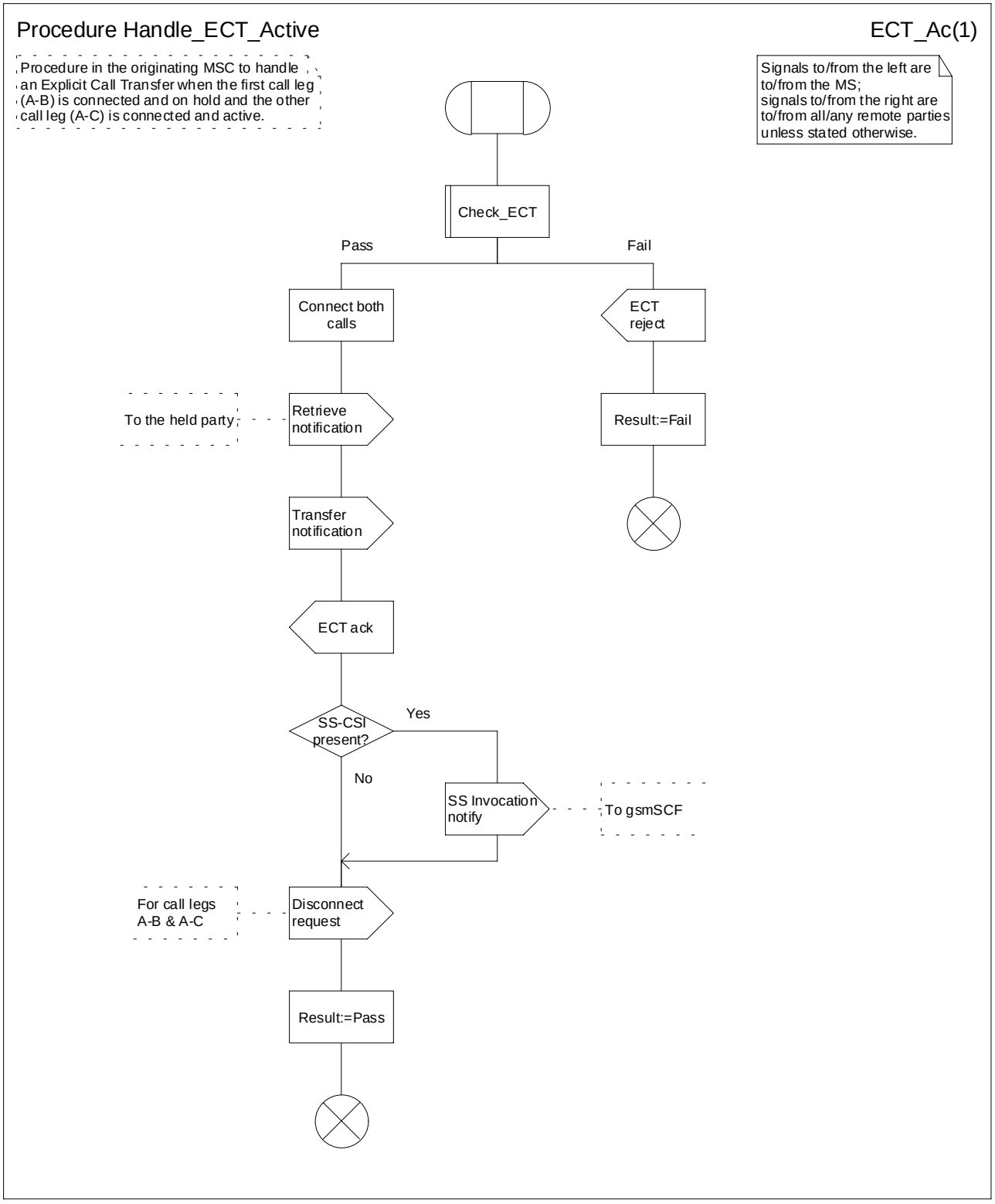
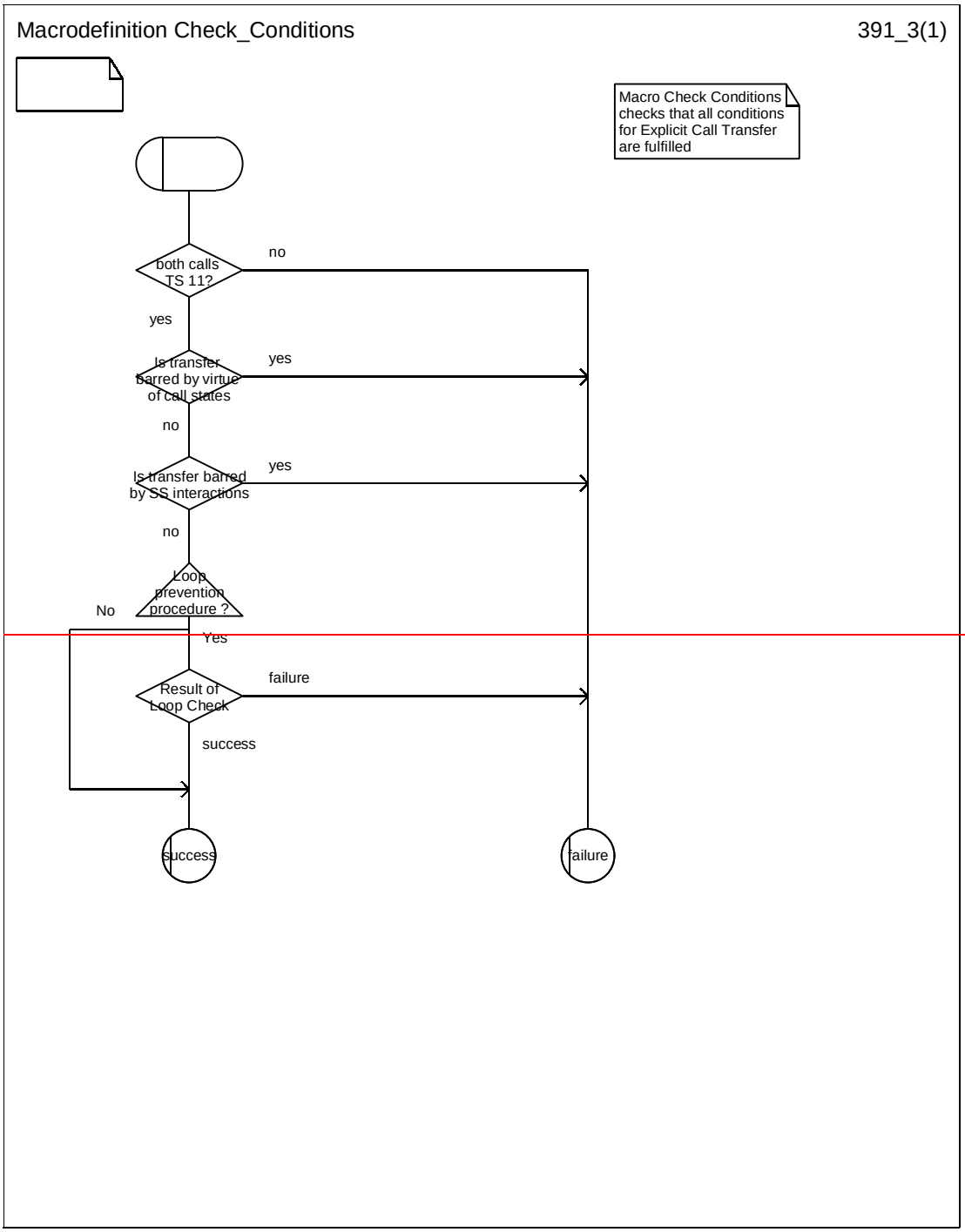


Figure 2: Procedure Handle_ECT_Active~~Overall SDL-diagram of Explicit Call Transfer (both calls answered)~~


Macrodefinition Check_Conditions
391_3(1)
Macro Check Conditions checks that all conditions for Explicit Call Transfer are fulfilled
both calls TS 11?
no
yes
Is transfer barred by virtue of call states
yes
no
Is transfer barred by SS interactions
yes
no
Loop prevention procedure ?
No
Yes
Result of Loop Check
failure
success
success
failure

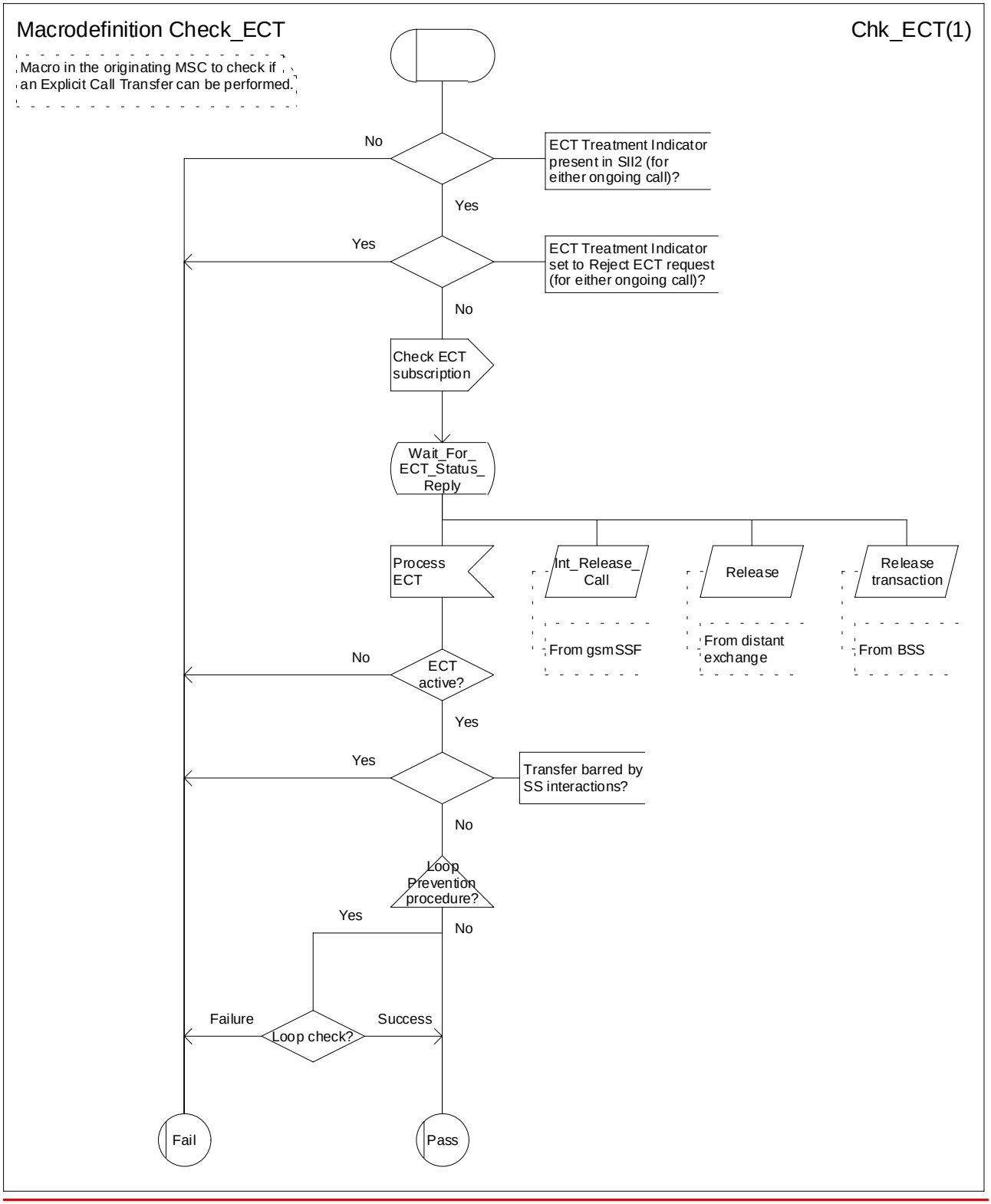


Figure 3: Macro Check_ECT ~~Conditions~~

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

4.2.3 ECT (one call answered, the other alerting)

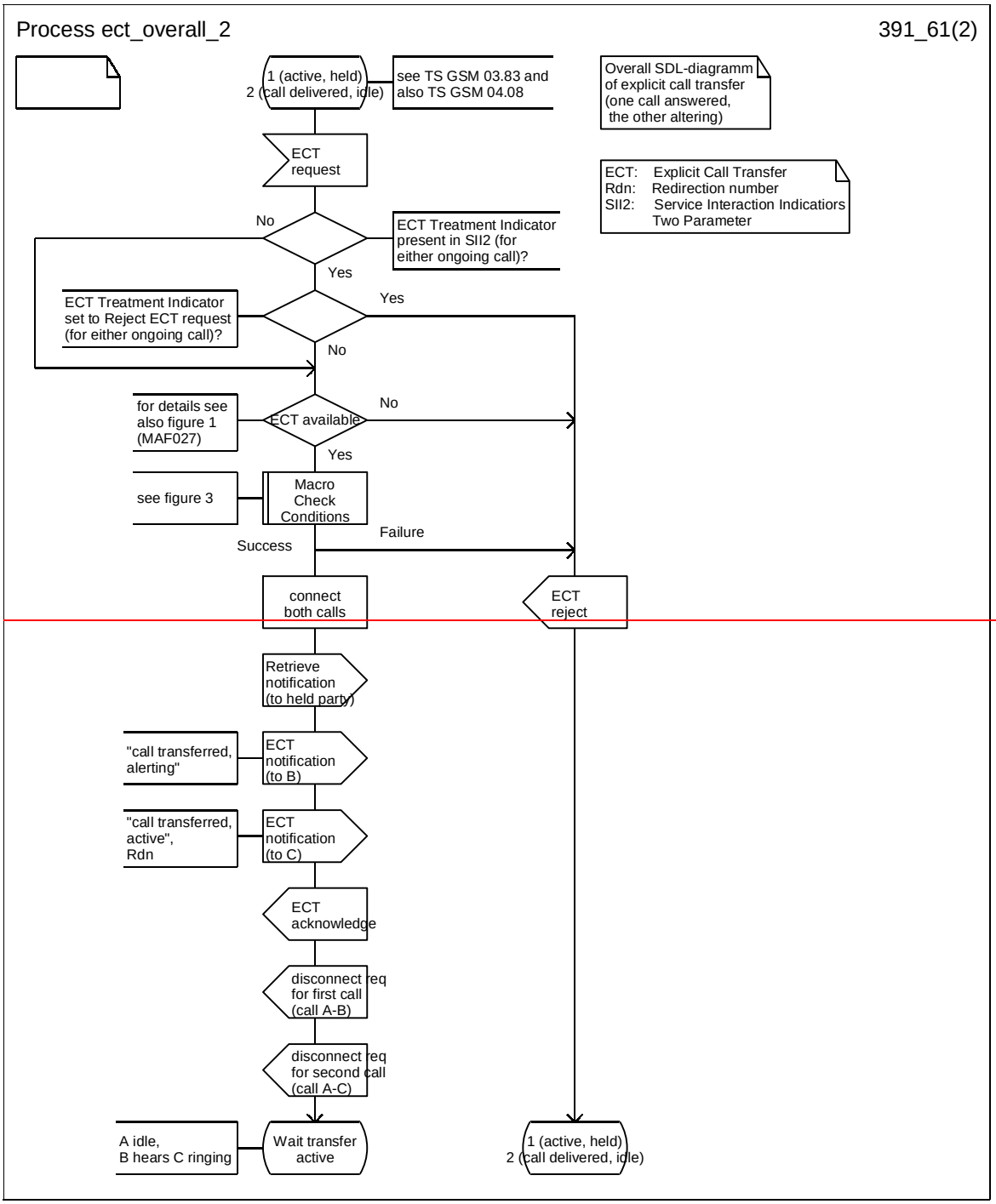
~~In this case, generally the same procedures will apply as in the other case (both calls answered). The same checks shall be performed and if all checks are fulfilled both calls shall be connected together (without including the served subscriber in this connection). After the connection of the both calls, both subscriber (B and C) will be notified about the call transfer invocation in the same way as in the case where the two calls are answered.~~

~~The transfer notification to the subscriber B will include the information that the transfer was done in the altering state of subscriber C ("call transferred, alerting"). After receipt of the answer message from subscriber C, the subscriber B will be notified again, indicating that answer has taken place subsequent to the alerting transfer ("call transferred, active").~~

The ~~overall~~ SDL for the procedure Handle_ECT_Alerting (Explicit Call Transfer - ~~(~~one call answered, the other alerting) is shown in figure 6.

The checks of whether Explicit Call Transfer is barred or not are shown in figure 3.

The corresponding information flows are given in figure 7 and figure 8.


Process ect_overall_2
391_61(2)
1 (active, held)
2 (call delivered, idle)
see TS GSM 03.83 and also TS GSM 04.08
Overall SDL-diagramm of explicit call transfer (one call answered, the other altering)
ECT request
ECT: Explicit Call Transfer
Rdn: Redirection number
SII2: Service Interaction Indicatiors Two Parameter
No
ECT Treatment Indicator present in SII2 (for either ongoing call)?
Yes
ECT Treatment Indicator set to Reject ECT request (for either ongoing call)?
Yes
No
for details see also figure 1 (MAF027)
ECT available
No
Yes
see figure 3
Macro Check Conditions
Failure
Success
connect both calls
ECT reject
Retrieve notification (to held party)
"call transferred, alerting"
ECT notification (to B)
"call transferred, active", Rdn
ECT notification (to C)
ECT acknowledge
disconnect req for first call (call A-B)
disconnect req for second call (call A-C)
A idle, B hears C ringing
Wait transfer active
1 (active, held)
2 (call delivered, idle)

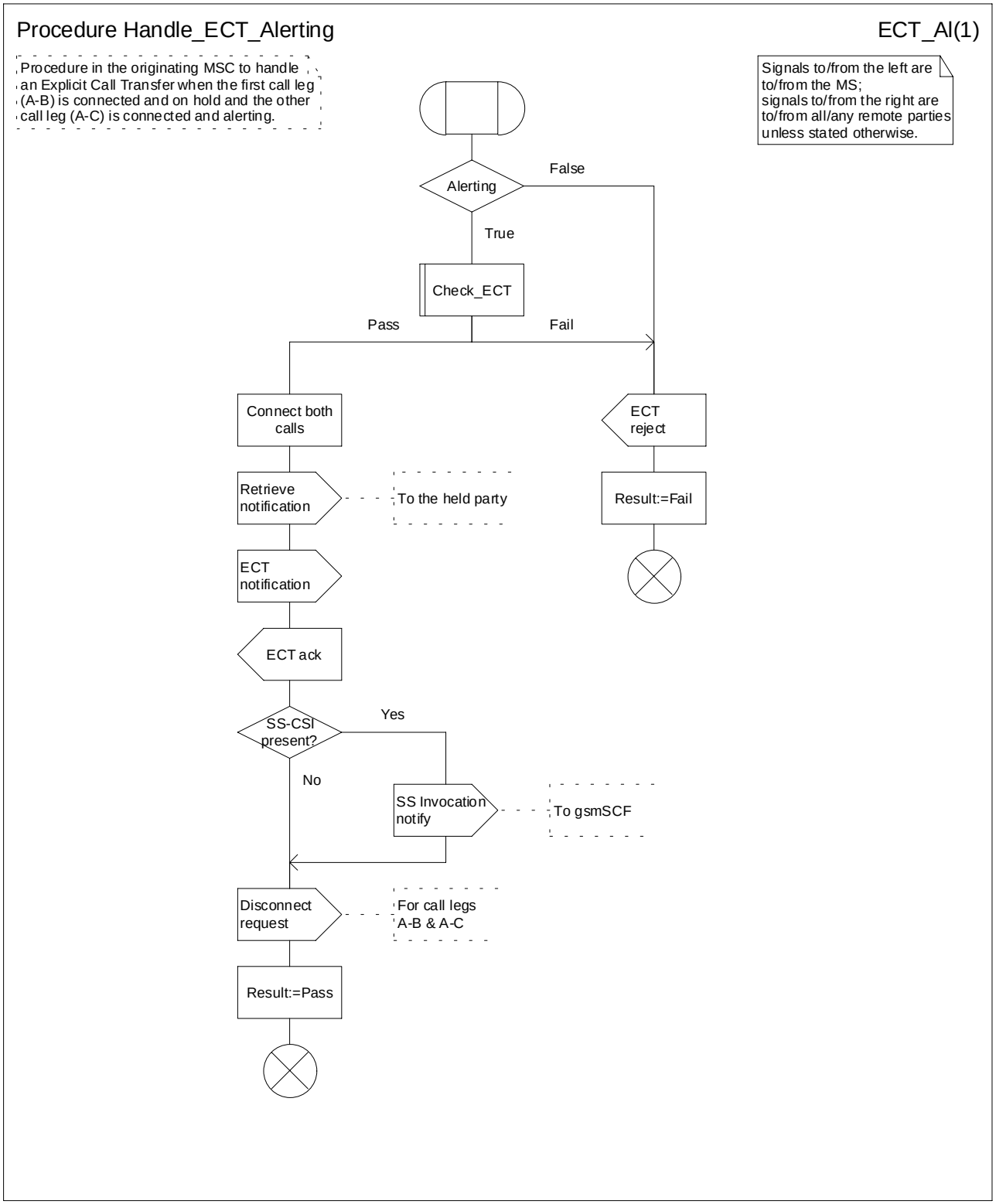
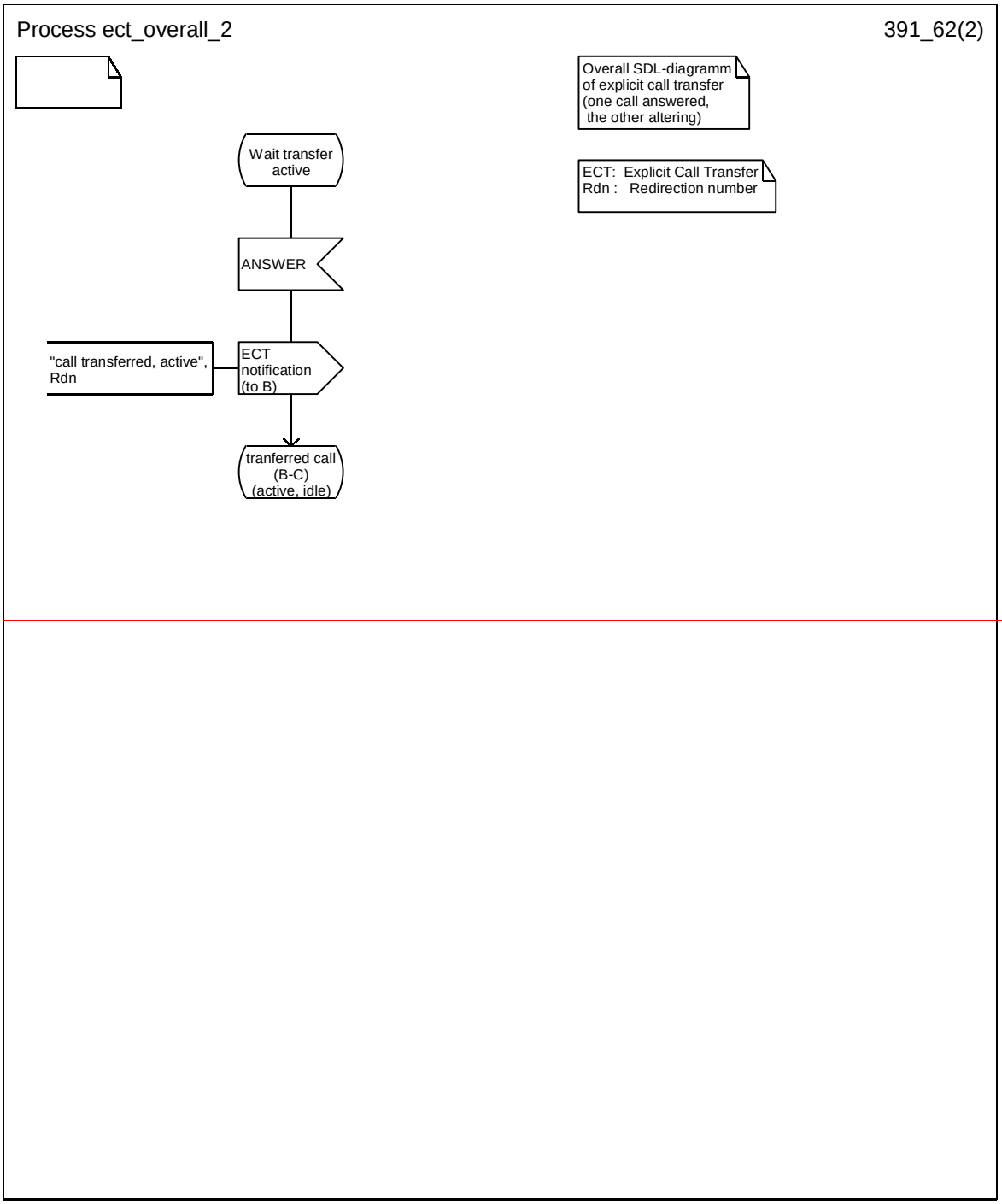


Figure 6: Procedure Handle_ECT_Alerting~~Overall SDL-diagram of explicit call transfer (one call answered, the other alerting)~~
(page 1 of ~~2~~1)



~~Figure 6: Overall SDL-diagram of explicit call transfer (one call answered, the other alerting) (page 2 of 2)~~

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

4.4 Information stored in the HLR

The following logical states are applicable for the Explicit Call Transfer service (refer to ~~GSM 03.11~~ 3GPP TS 23.011 [6] for an explanation of the notation):

Provisioning State	**Registration State**	**Activation State**	**HLR Induction State**
(Not Provisioned,	Not Applicable,	Not Active,	Not Induced)
(Provisioned,	Not Applicable,	Active and Operative,	Not Induced)

The HLR shall store the logical state of the Explicit Call Transfer service (which shall be one of the valid states listed above) on a per subscriber basis.