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Technical Specification

3rd Generation Partnership Project; Technical Specification Group Core Network; Multicall supplementary service - Stage 2 (3G TS 23.135 version 1.0.0 Release 1999)

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Contents

Foreword

This Technical Specification has been produced by the 3GPP.

This specification gives the stage 2 description of the Multicall service within the 3GPP system.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 Indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

This Technical Specification gives the stage 2 description of the Multicall supplementary service.

2 Normative references

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case 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] 3G TR 21.905: " 3GPP Vocabulary "

[2] 3G TS 22.100: " UMTS Phase 1"

[3] 3G TS 22.105: " Services & Service capabilities "

[4] 3G TS 22.135: " Multicall Stage 1"

[5] 3G TS 23.009: " Handover procedures"

[6] 3G TS 23.011: " Technical realisation of supplementary services"

[7] 3G TS 23.018: " Basic call handling; Technical realization"

[8] 3G TS 23.083: " Call Waiting (CW) and Call Hold (HOLD) Supplementary Service - Stage 2"

[9] 3G TS 24.008: " Mobile radio interface layer 3 specification Core Network Protocol – Stage 3"

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 22.135 and the following apply.

Speech Call: Speech call means one of TS11 (Telephony), TS12 (Emergency call), TS61 (Alternate speech and facsimile group 3), TS91 (Voice Group Call Service) and TS92 (Voice Broadcast Service)

3.2 Abbreviations

Abbreviations used in this specification are listed in TR 21.905.

4 Descriptions

4.1 Handling of Multicall

4.1.1 Provision

No special signalling procedures apply.

4.1.2 Withdrawal

No special signalling procedures apply.

4.1.3 Registration

The information flow for registration is shown in figure 4.1/1. The registration process is shown in figure 4.1/2.

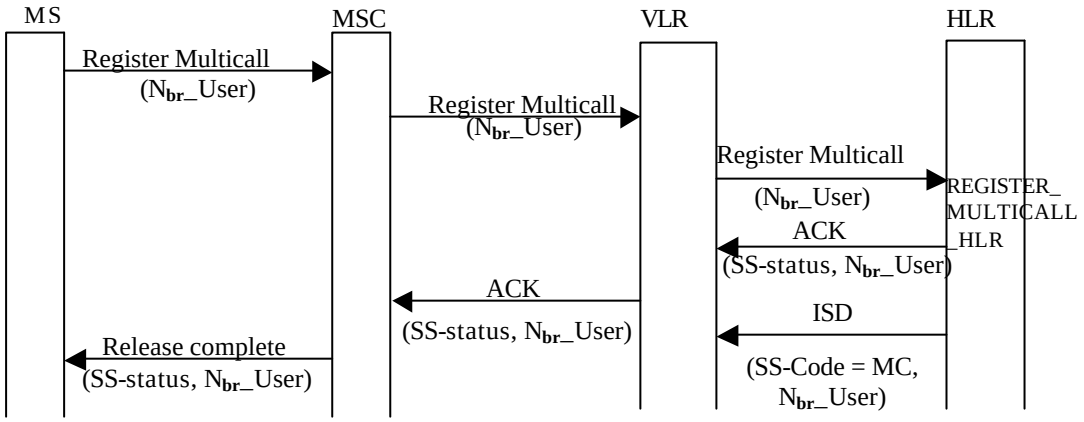

Figure 4.1/1: Registration of Multicall

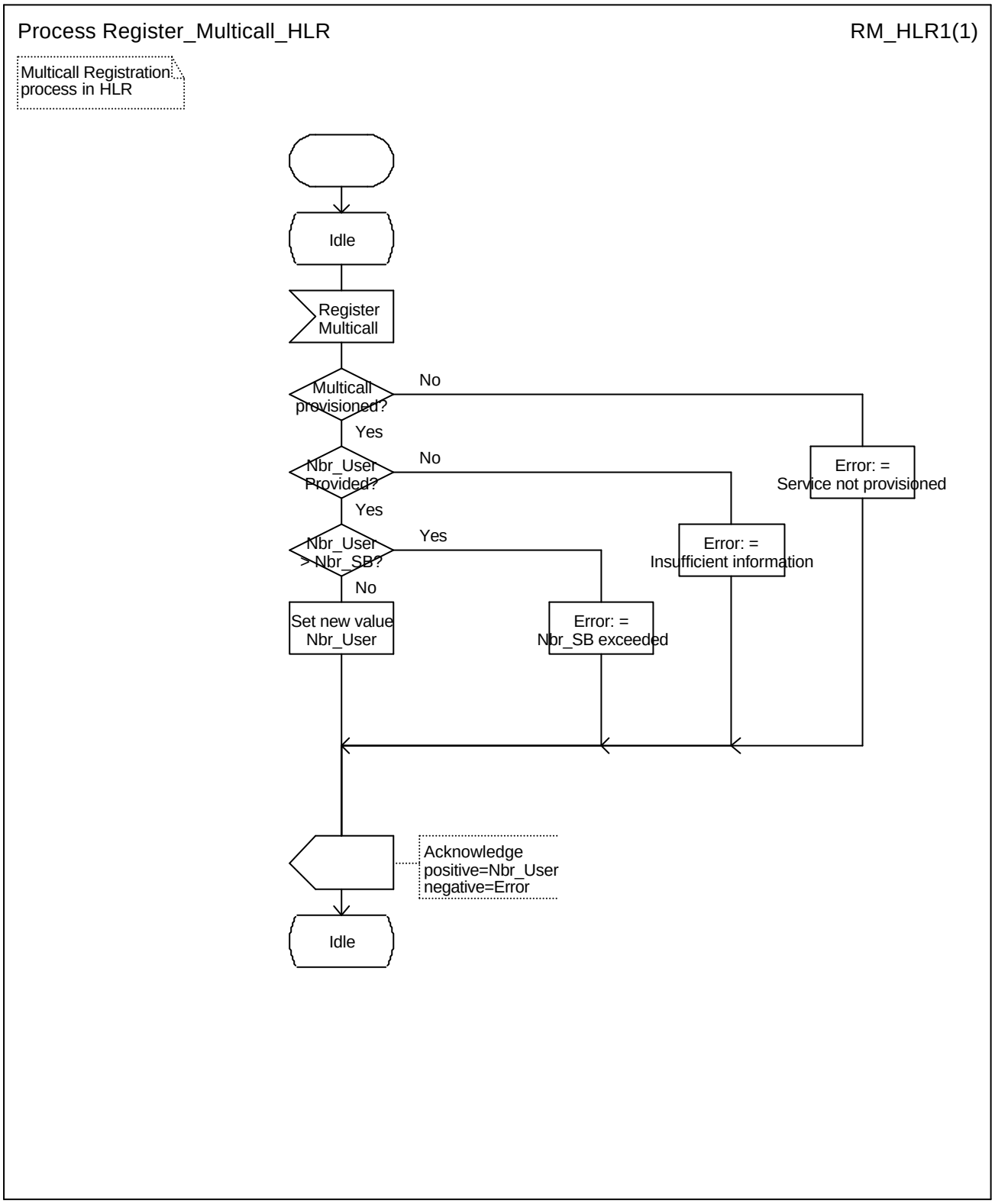

Figure 4.1/2: Process Register_Multicall_HLR

4.1.4 Erasure

No special signalling procedures apply.

4.1.5 Activation

The service provider shall provide an initial value for N_{br}_User when activating the service. No special signalling procedures apply.

4.1.6 Deactivation

No special signalling procedures apply.

4.1.7 Interrogation

The information flow for interrogation is shown in figure 4.1/3. The interrogation process is shown in figure 4.1/4.

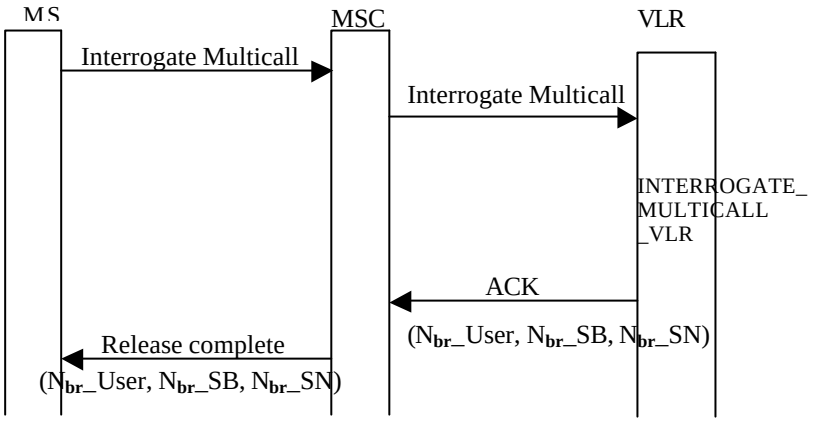

Figure 4.1/3: Interrogation of Multicall

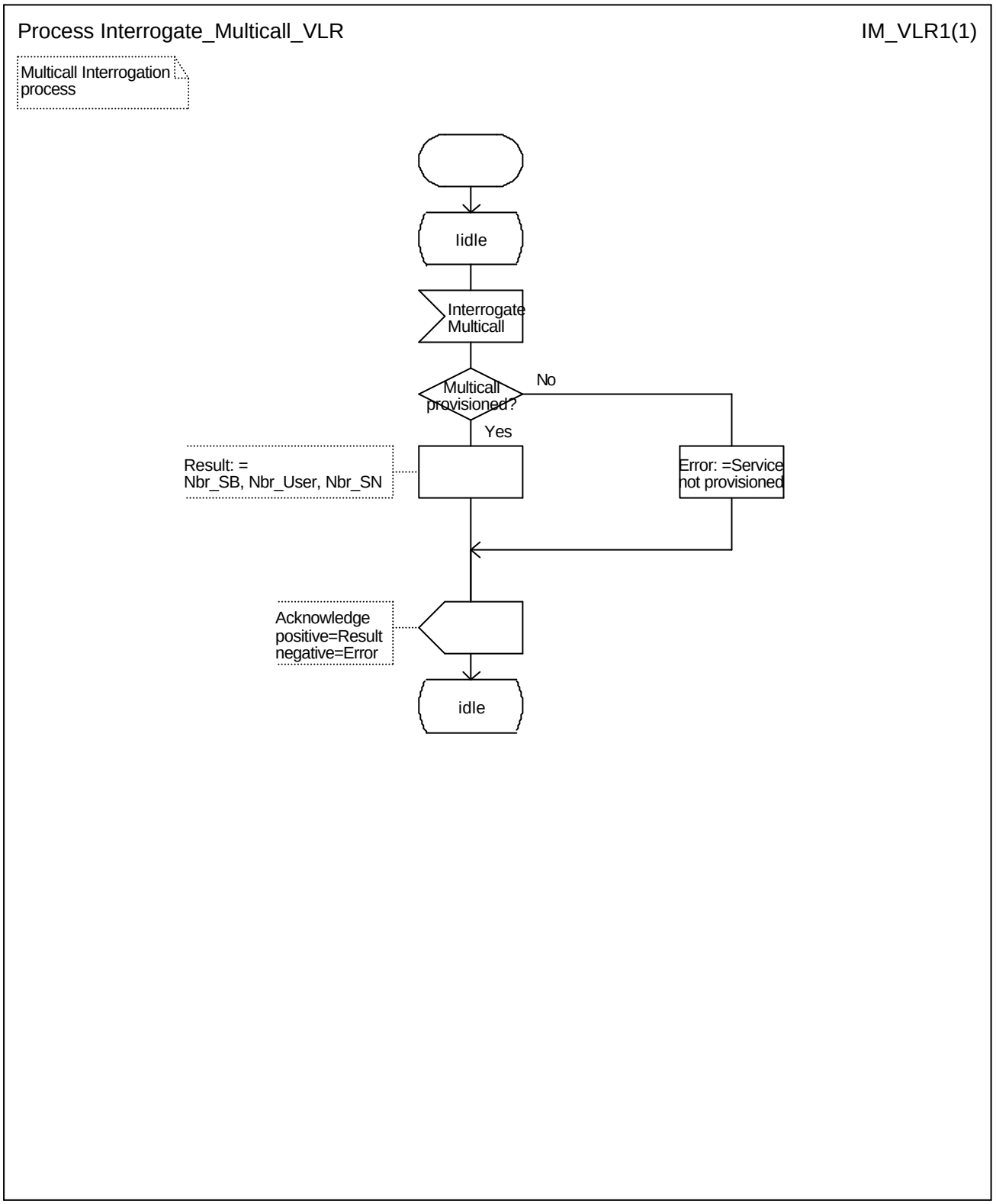

Figure 4.1/4: Process Interrogate_Multicall_VLR

4.2 Call related procedures

The procedures for basic call handling are specified in TS 23.018. These shall also be used for Multicall.

4.2.1 MO call

Figure 4.2/1 shows the flow of information between network elements for an MO call:

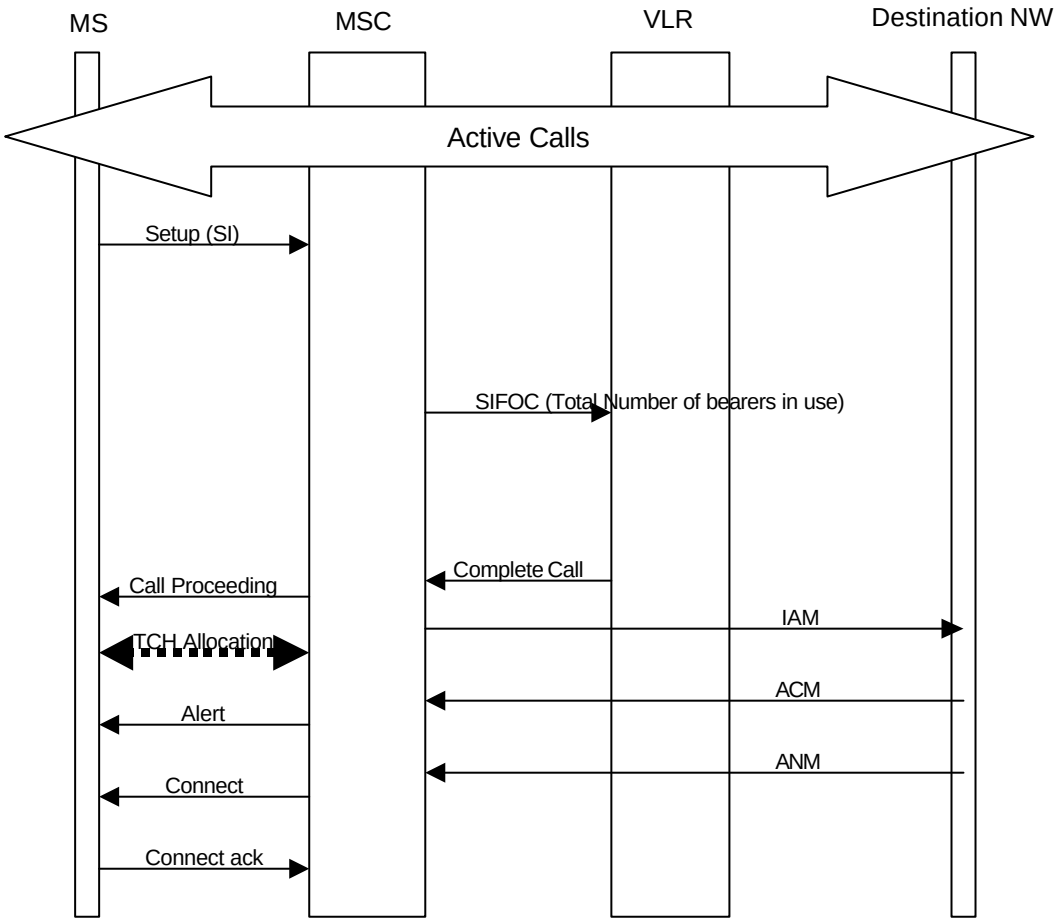

Figure 4.2/1: Information flow for mobile originating call

4.2.2 MT call

Figure 4.2/2 and Figure 4.2/3 show the flow of information between network elements for an MT call:

Case 1: When the MS requests a new bearer in call confirmed. (Figure 4.2/2)

Case 2: When the MS requests a new bearer in Connect. (Figure 4.2/3)

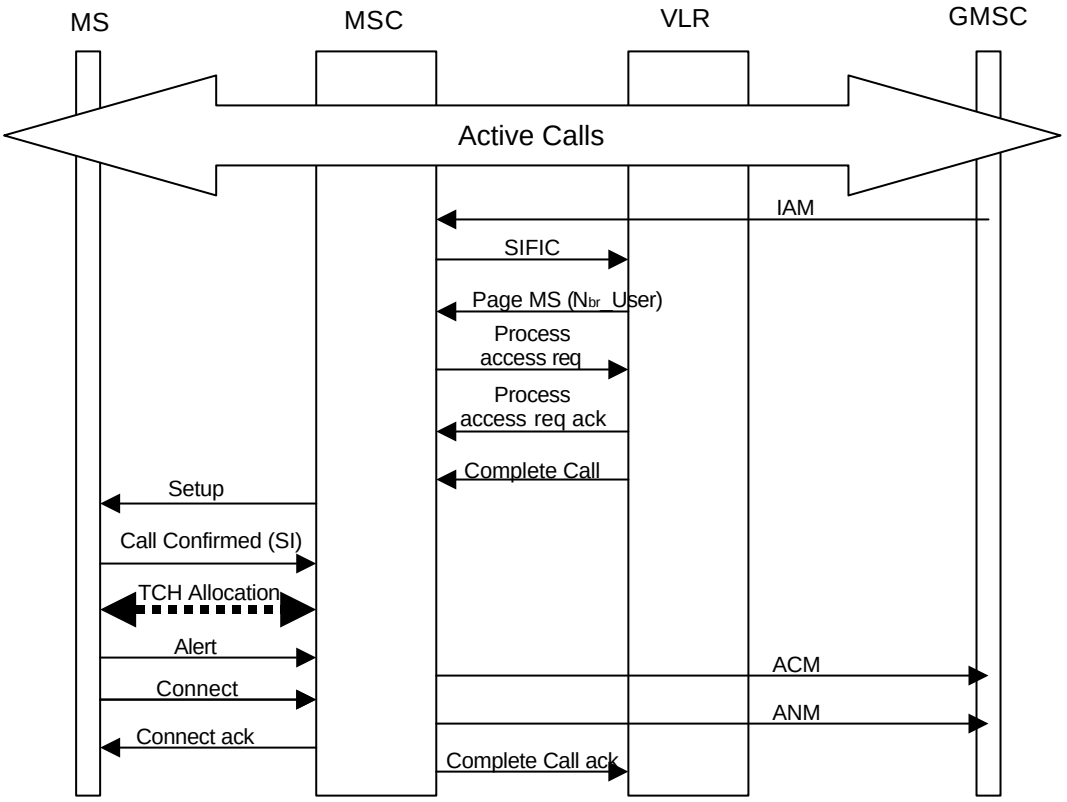

Figure 4.2/2: Information flow for mobile terminating call (Case1)

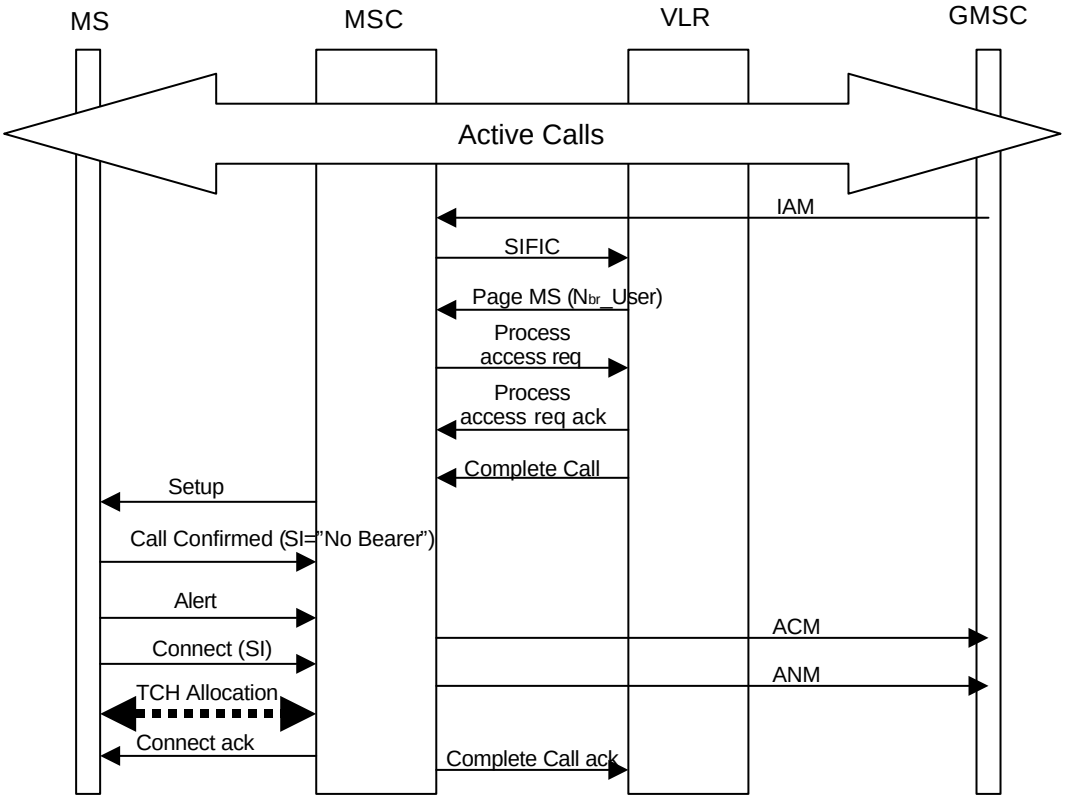

Figure 4.2/3: Information flow for mobile terminating call (Case2)

4.3 Messages and their contents

This clause contains the detailed description of the information flows used by Multicall.

Each Information Element, IE, is marked as (M) Mandatory, (C) Conditional or (O) Optional. A mandatory information element shall always be present. A conditional information shall be present if certain conditions are fulfilled; if those conditions are not fulfilled it shall be absent. An optional information element may be present or absent, at the discretion of the application at the sending entity. This categorisation is a functional classification, i.e., stage 2 information and not a stage 3 classification to be used for the protocol.

The stage 2 and stage 3 message and information element names are not necessarily identical.

4.3.1 Messages between MS and MSC

Table 4.3/1 indicates messages between the MS and the MSC for mobile originating calls and mobile terminating calls. (Refer to TS 24.008)

The MS shall indicate the maximum number of bearers supported by the MS in the CC capabilities IE. The MS shall also indicate the maximum number of simultaneous speech bearers supported by the MS for future compatibility. For Release 99, the maximum number of simultaneous speech bearers is 1. If the MS does not indicate the maximum number of bearers the network shall assume it does not support Multicall.

The network supporting Multicall shall indicate the capability in the NW CC capabilities IE. If the NW CC capabilities IE is not sent from the network, the MS supporting Multicall shall assume that the network doesn't support Multicall. If an MS initiating an emergency call is located in a network that does not support Multicall, the MS shall release one or more existing call to ensure that the emergency call can be established.

Table 4.3/1: Messages between MS and MSC

Message	Message sender	Information element name	Information element Required	Information element description
Setup (MO)	MS	Stream Identifier	M	This information element indicates which bearer (new or existing) shall be used for the call.
		CC Capabilities	C	For the first call, this information element shall be included to indicate the maximum number of bearers supported by the MS.
Emergency Setup	MS	Stream Identifier	M	This information element indicates which bearer (new or existing) shall be used for the call.
Call Confirmed	MS	Stream Identifier	M	This information element indicates which bearer (new or existing) shall be used for the call.
		CC Capabilities	C	For the first call, this information element shall be included to indicate the maximum number of bearers supported by the MS.
Connect (MT)	MS	Stream Identifier	C	This IE shall be present in the Connect message if the SI contained "No bearer" in the Call Confirmed message, otherwise shall be absent.
Setup (MT)	NW	NW CC Capabilities	C	This information element shall be present for the first call.
Call Proceeding	NW	NW CC Capabilities	C	

4.3.2 Messages on B interface (MSC-VLR)

4.3.2.1 Send Info For Outgoing Call

This message is specified in TS 23.018. The following additional information element is required:

Information element name	Required	Description
Total number of bearers in use	M	This IE includes the new bearer if requested for the call.

4.3.2.2 Send Info For Outgoing Call negative response

This message is specified in TS 23.018. The following additional information element is required:

Information element name	Required	Description
Negative response information element	M	If the VLR detects that the OG call can not be permitted because Multicall limit set by the user is exceeded, it shall indicate " N_{br}_User is exceeded" as the negative response information element value. If the VLR detects that the OG call can not be permitted because the user is not provisioned with Multicall, it shall indicate "Multicall not provisioned" as the negative response information element value.

4.3.2.3 Send Info For Incoming Call

This message is specified in TS 23.018.

4.3.2.4 Send Info For Incoming Call ack

This message is specified in TS 23.018.

4.3.2.5 Send Info For Incoming Call negative response

This message is specified in TS 23.018.

4.3.2.6 Complete Call

This message is specified in TS 23.018.

4.3.2.7 Complete Call ack

This message is specified in TS 23.018.

4.3.2.8 Page MS

This message is specified in TS 23.018. The following additional information element is required:

Information element name	Required	Description
N_{br}_User	M	Shall be present if the subscriber is provisioned with Multicall.

4.3.2.9 Page MS negative response

This message is specified in TS 23.018. The following additional information element is required:

Information element name	Required	Description
Basic service list	C	If the MSC detects subscriber busy (More Calls Possible), the Basic service list shall be included, see Table 4.3/2.

Table 4.3/2 Basic Service List setting

Condition		Setting
The terminating call type is speech	There exists an active or held speech call	Basic service of active call via the same bearer as the existing speech call. If an active call does not exist via the same bearer as the existing speech call "speech" shall be indicated.
	There exists no speech call	All basic services of ongoing calls
The terminating call type is not speech		All basic services of ongoing calls

4.3.2.10 Process Access Request

This message is specified in TS 23.018.

4.3.2.11 Process Access Request ack

This message is specified in TS 23.018.

4.3.2.12 Process Access Request negative response

This message is specified in TS 23.018.

4.3.2.13 Search For MS

This message is specified in TS 23.018. The following additional information element is required:

Information element name	Required	Description
N_{br}_User	M	Shall be present if the subscriber is provisioned with Multicall.

4.3.2.14 Search For MS ack

This message is specified in TS 23.018.

4.3.2.15 Search For MS negative response

This message is specified in TS 23.018. The following additional information element is required:

Information element name	Required	Description
Basic service list	C	If the MSC detects subscriber busy (More Calls Possible), the Basic service list shall be included, see Table 4.3/2.

5 Network entity functions

The following SDL diagrams describe the procedures within individual network entities for handling Multicall.

5.1 General

The MSC shall check whether the maximum number of bearers has been reached for both MO and MT call. In counting of the current number of bearers for the target subscriber, the following situations are counted as an active bearer.

- Call in setup
- Established call
- Call on hold
- Call on hold and established call on the same bearer
- Call on hold and MO call in setup on the same bearer

5.2 MO call

5.2.1 Functional requirements of serving MSC

Figure 5.2/1: Procedure Check_OG_Multicall_MSC

This procedure is called when the MSC receives a Setup message from the MS. After handover procedure completion to another MSC, N_{br}_SN as defined for the target MSC shall overwrite the previous N_{br}_SN.

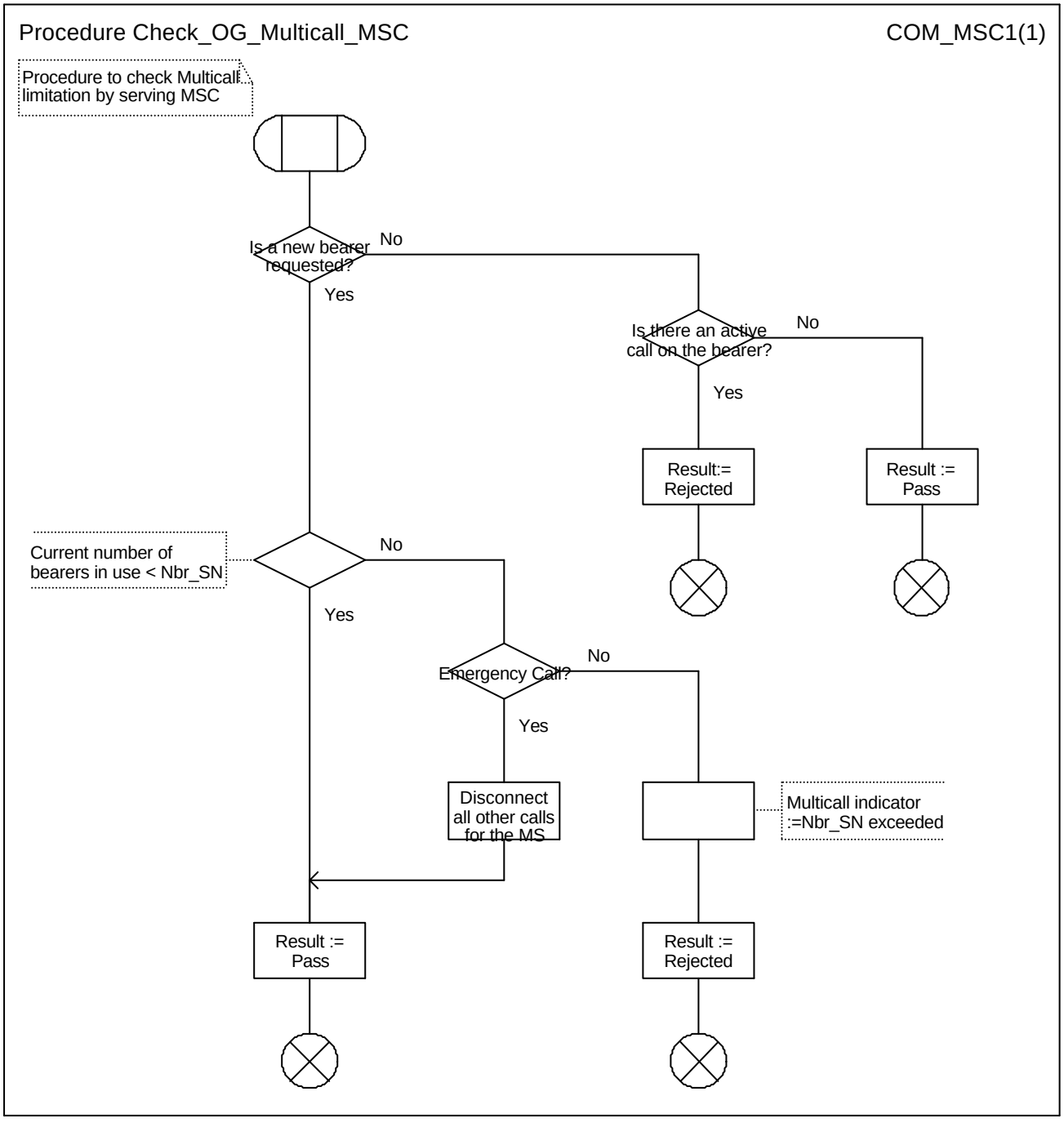

Figure 5.2/1: Procedure Check_OG_Multicall_MSC

5.2.2 Functional requirements of VLR

Figure 5.2/2: Procedure Check_OG_Multicall_VLR

This procedure is called when the VLR receives a Send Info For Outgoing Call message from the MSC.

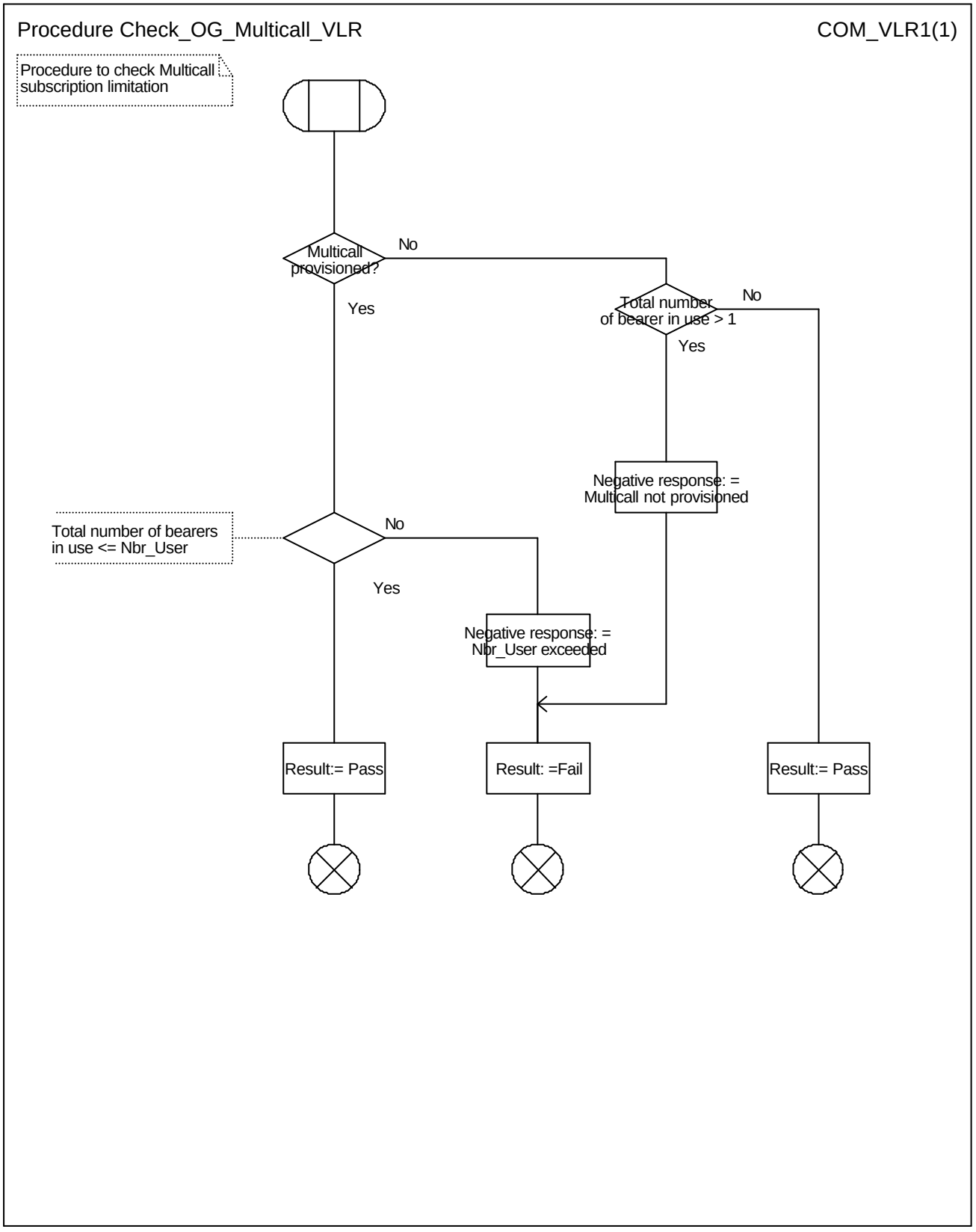

Figure 5.2/2: Procedure Check_OG_Multicall_VLR

5.3 MT call

5.3.1 Functional requirements of serving MSC

Figure 5.3/1: Procedure Check_MT_Multicall_MSC

This procedure is called when the MSC receives a Page MS message or a Search For MS message from the VLR. The maximum number of bearers (N_{br}) indicates the minimum value of N_{br}_User, N_{br}_SN and N_{br}_UE. After handover to another MSC is completed, N_{br}_SN, as defined for the target MSC, shall overwrite the previous N_{br}_SN.

"Call in setup" means that the MS is engaged in at least one call that has not reached the established phase (called party answer).

The test "Call waiting" takes the "Yes" exit if a waiting call has been offered to the subscriber but the outcome of offering the call has not been determined.

Figure 5.3/2: Procedure Establish_Terminating_TCH_Multicall1

This procedure is called when the MSC receives a Call Confirmed message from the MS. If the MS indicates "No bearer" as the value of the Stream Identifier in the Call Confirmed message the test "Bearer allocation pending" takes the "Yes" exit.

Figure 5.3/3: Procedure Establish_Terminating_TCH_Multicall2

This procedure is called when the MSC receives a Connect message from the MS.

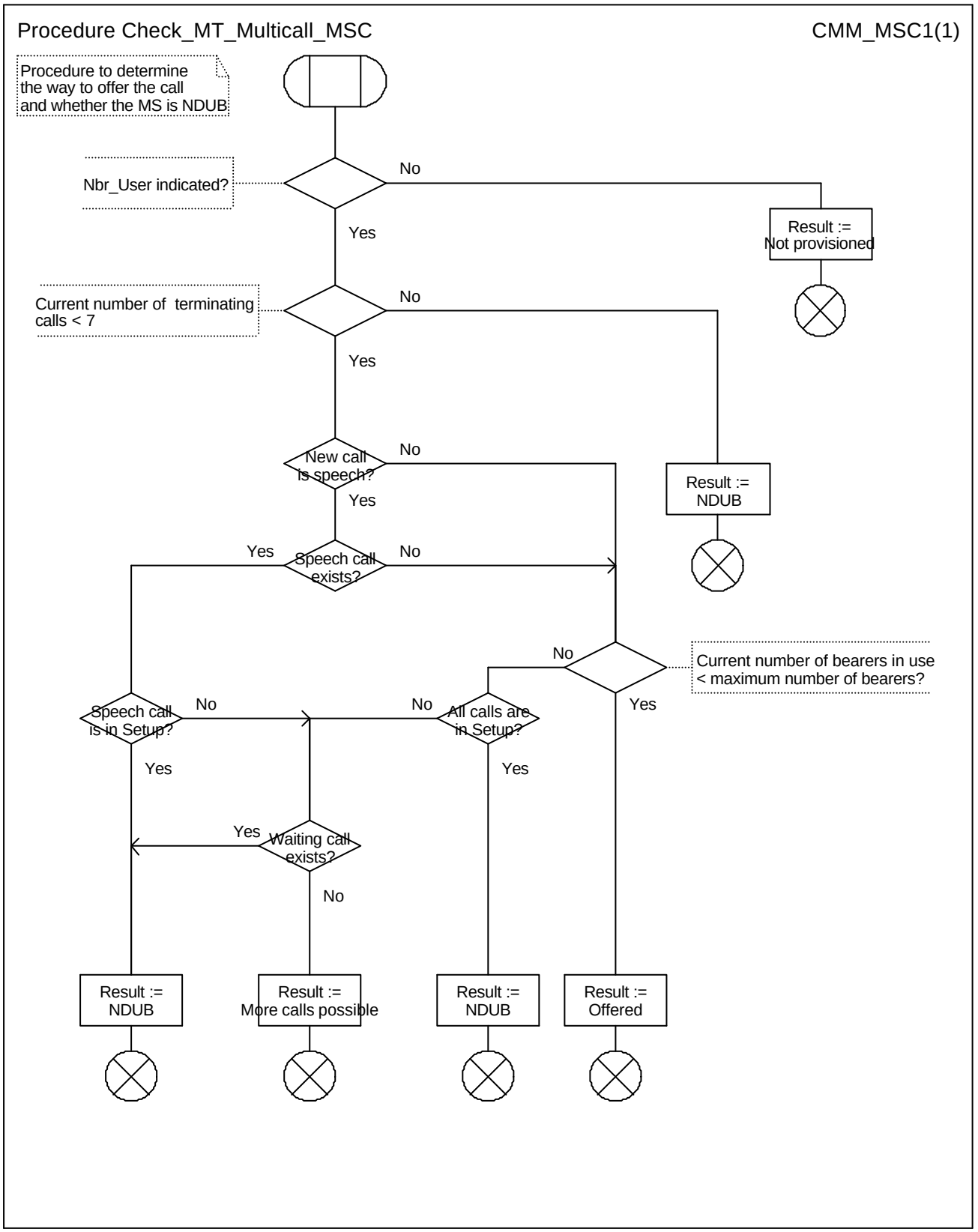

Figure 5.3/1: Procedure Check_MT_Multicall_MSC

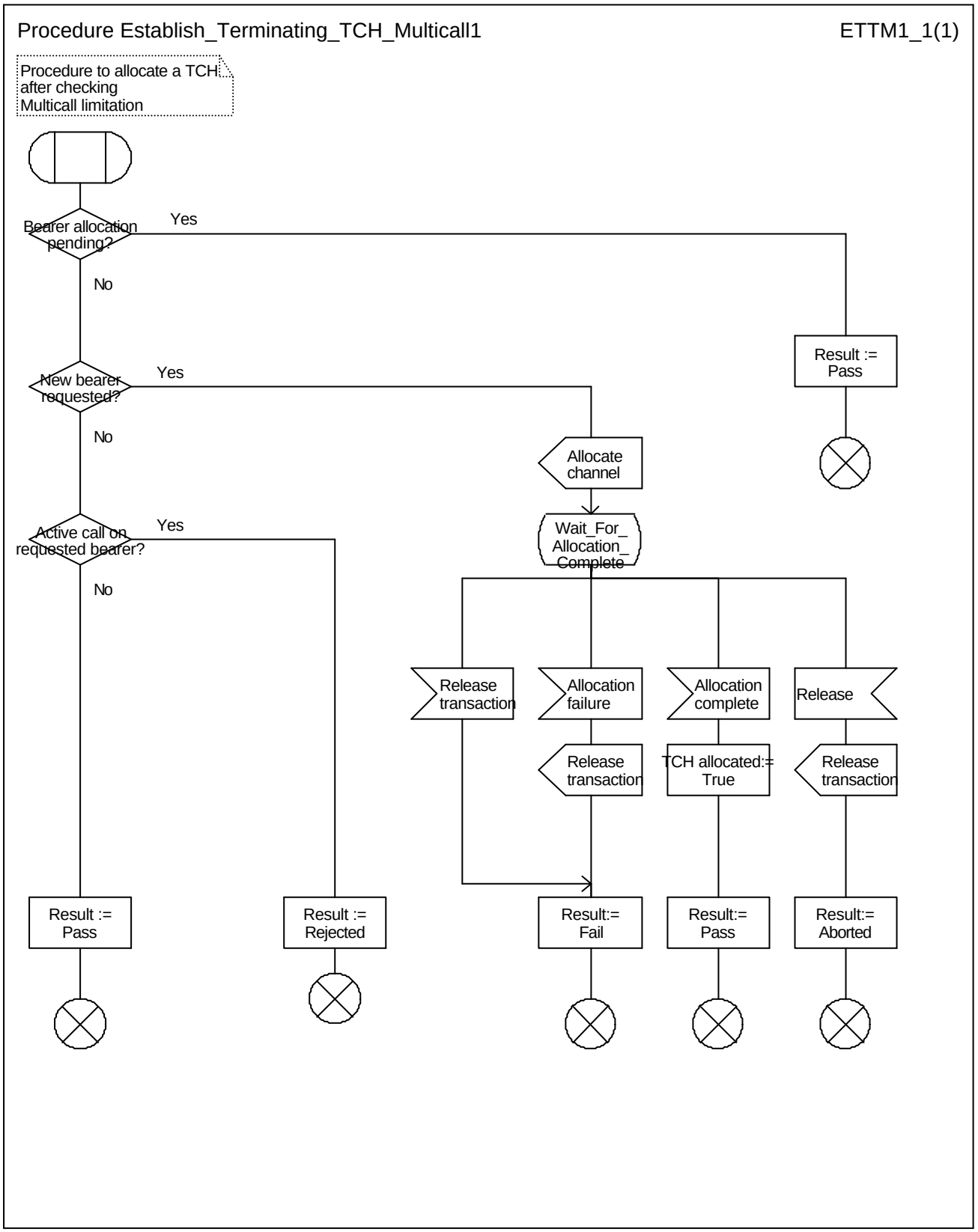

Figure 5.3/2: Procedure Establish_Terminating_TCH_Multicall1

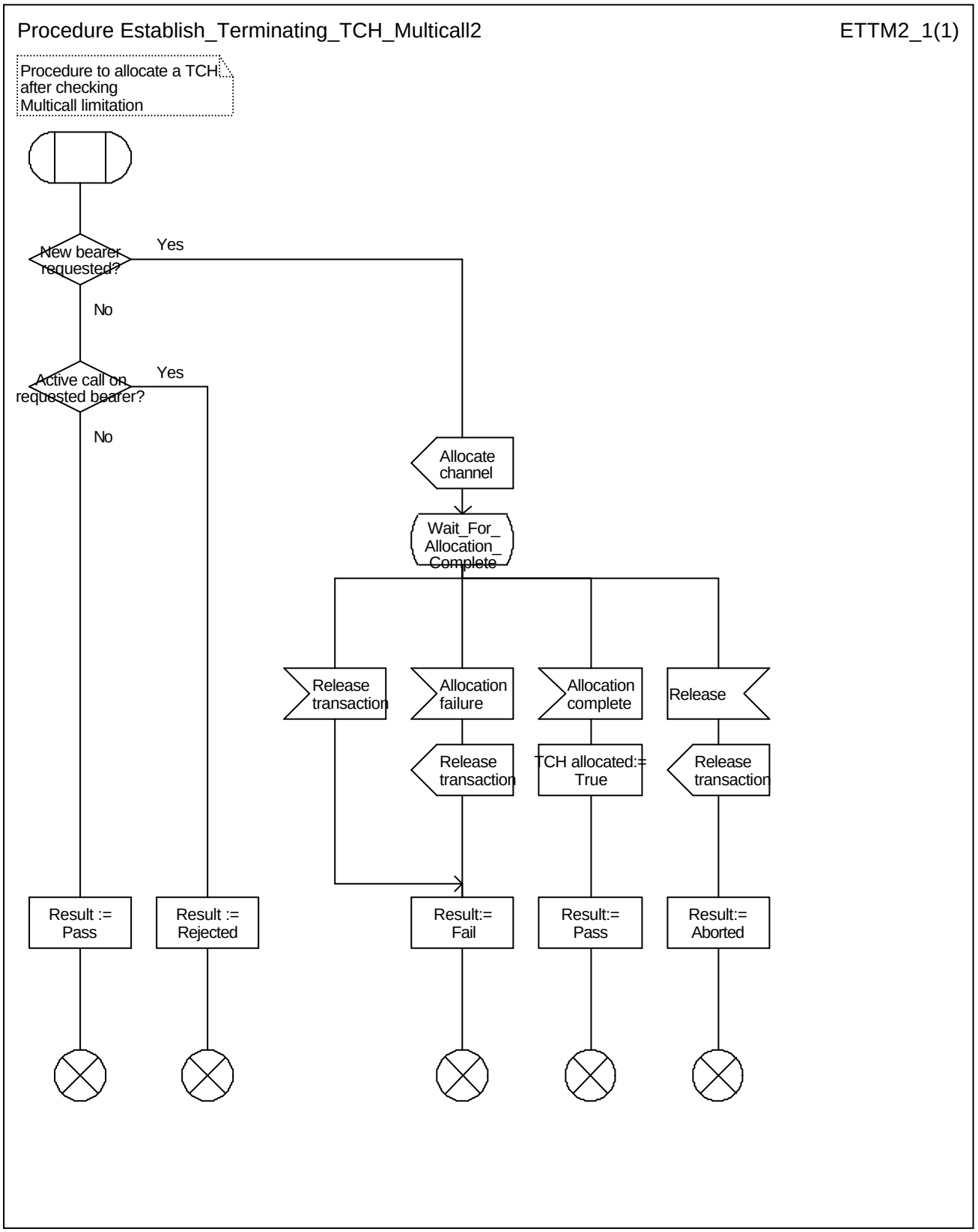

Figure 5.3/3: Procedure Establish_Terminating_TCH_Multicall2

5.3.2 Functional requirements of VLR

Figure 5.3/4: Procedure Get_CW_Subscription_Info_Multicall_VLR

This procedure is called when the VLR receives a Page MS negative response message or a Search For MS negative response message with the negative response IE set to "Busy (More Calls Possible)".

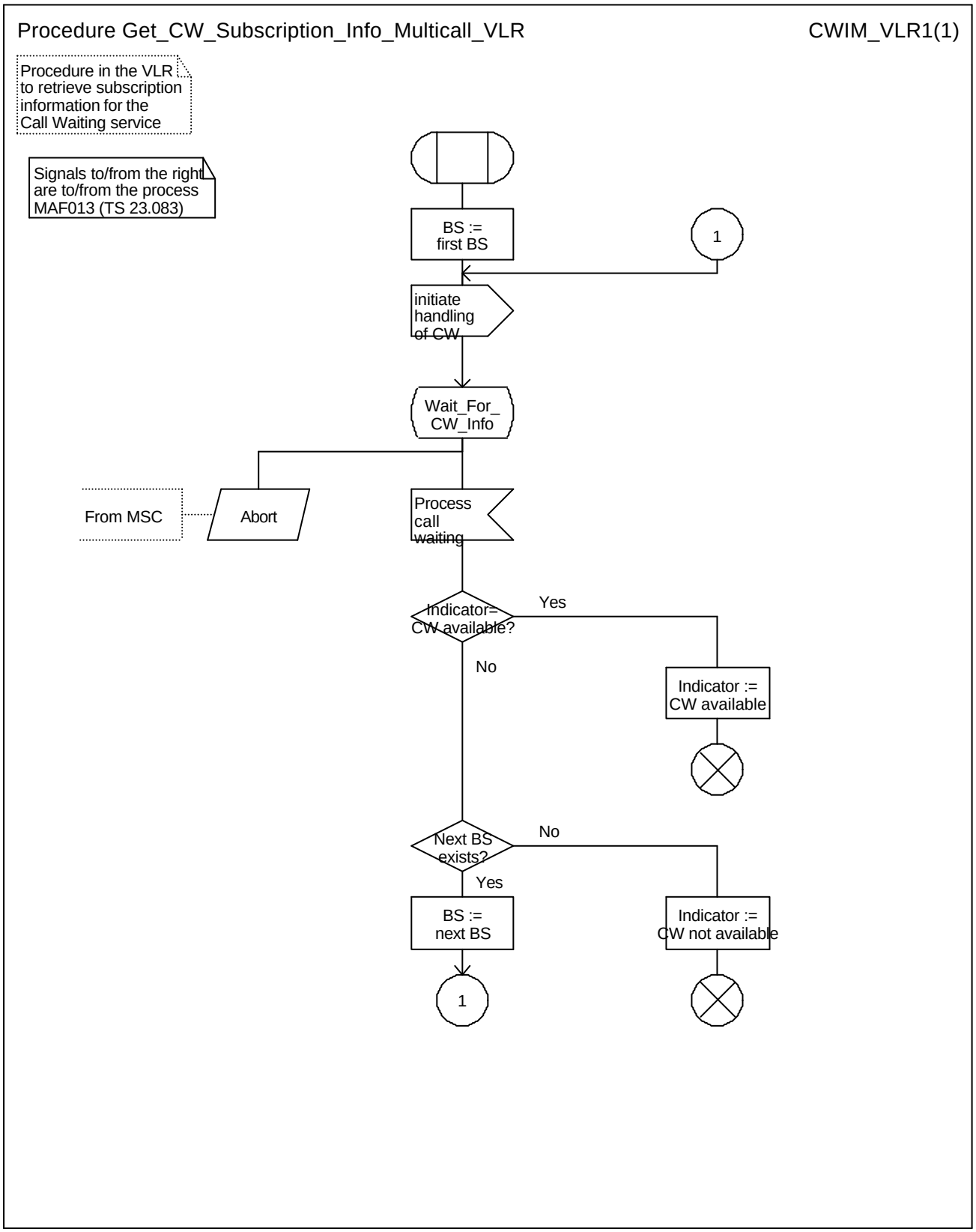

Figure 5.3/4: Procedure Get_CW_Subscription_Info_Multicall_VLR

6 Interaction with telecommunication services

6.1 Speech

The Multicall supplementary service does not provide multiple traffic channels for speech calls. Refer to Procedure Check_OG_Multicall_MSC and Procedure Check_MT_Multicall_MSC.

If N_{br}_UE is greater than N_{br}_SN, the mobile station may initiate an Emergency call even if N_{br}_SN has been reached. When the network receives an Emergency call setup message from the mobile station,

- if N_{br}_SN has not been reached, the network shall accept it regardless of N_{br}_SB or N_{br}_User.
- if N_{br}_SN has been reached, the network shall accept the emergency call after tearing down all other active calls.

The MS shall ensure that an emergency call setup request is acceptable to a serving network which does not support multicall, if necessary by releasing one or more existing calls.

6.2 Short message service

No impact.

6.3 Facsimile service

The Multicall supplementary service provides multiple traffic channels for facsimile service except for alternate speech and facsimile group 3.

6.4 Data circuit asynchronous

The Multicall supplementary service provides multiple traffic channels for data circuit asynchronous.

6.5 Data circuit synchronous

The Multicall supplementary service provides multiple traffic channels for data circuit synchronous.

6.6 Voice group service

The Multicall supplementary service doesn't provide multiple traffic channels for Voice group service.

6.7 GPRS

No impact

7. Interaction with other supplementary services

7.1 Line Identification services

No impact

7.2 Call forwarding unconditional (CFU)

No impact

7.3 Call forward on busy (CFB)

The condition NDUB occurs in accordance with the definition for multicall. (See TS 22.135)

7.4 Call forwarding on no reply (CFNRy)

No impact

7.5 Call forwarding on MS not reachable (CFNRc)

No impact

7.6 Call Hold (CH)

No impact

7.7 Call Waiting (CW)

Call Waiting SS will be invoked under the conditions described in TS 22.135.

7.8 Multiparty service (MPTY)

No impact

7.9 Closed user group (CUG)

No impact

7.10 Advice Of Charge (AoC)

No impact

7.11 Call Barring services

No impact

7.12 Explicit call transfer (ECT)

No impact

7.13 Call Deflection (CD)

No impact

7.14 Completion of calls to busy subscriber (CCBS)

The NDUB condition occurs in accordance with the definition for multicall. (See TS 22.135)

A subscriber provisioned with multicall is in the idle state when the subscriber has no ongoing (active or held) calls. CCBS requests in the destination B CCBS queue shall be processed if destination B is idle.

8. Interaction with network features

8.1 Customised Applications for Mobile network Enhanced Logic (CAMEL)

No impact

8.2 Support of Optimal Routeing (SOR)

No impact

8.3 Operator Determined Barring (ODB)

No impact

9. Information stored in the HLR

The following logical states are applicable for Multicall (refer to TS 23.011 for an explanation of the notation):

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

The HLR shall store:

- The state of Multicall (which shall be one of the valid states listed above) per subscriber;
- The subscription option "maximum number of bearers N_{br}_SB" per subscriber;

  This subscription option takes a value in the range (2 – 7);
- The subscription option “maximum number of bearers N_{br}_User” per subscriber;

  This subscription option takes a value in the range (1 – N_{br}_SB).

10. State transition model

Figure 10.1 shows the successful cases of transition between the applicable logical states of Multicall. The state changes are caused by actions of the service provider.

Note that error cases are not shown in the diagram, as they normally do not cause a state change. Additionally, some successful requests may not cause a state change. Hence they are not shown in the diagram.

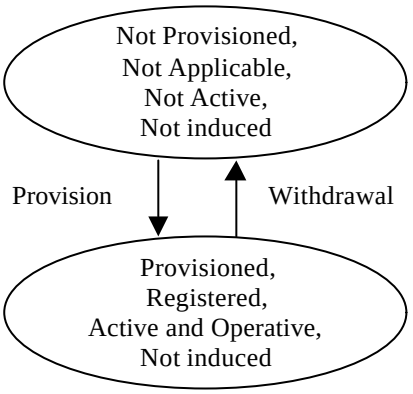

Figure 10.1: State transition model for Multicall

11. Transfer of information from HLR to VLR

If the provisioning state for Multicall is "Provisioned" then when the subscriber registers on a VLR the HLR shall send that VLR information about the logical state of Multicall, $N_{br_}$User and $N_{br_}$SB.

If the logical state of Multicall, the subscription options $N_{br_}$SB or $N_{br_}$User are changed while a subscriber is registered on a VLR then the HLR shall inform the VLR of the new logical state of Multicall, the new $N_{br_}$User or the new $N_{br_}$SB.

12. Information stored in VLR

The VLR shall store the service state information, $N_{br_}$SB and $N_{br_}$User as received from the HLR.

13. Handover

In the case that the network supports Multicall, it shall be possible to handover multiple bearers (See TS 23.009).

Annex A (Informative)

The following table shows some examples

1. Mobile Originating Call (MO call)

- As an example: N_{br}=2.

Current Status				Additional MO call	
No	Status	Number of bearers	Number of calls	Speech	Data
1	None	0	0	Acceptable	Acceptable
2	1 Speech call(active)	1	1	Rejected	Acceptable
3	1 Speech call(on hold)	1	1	Acceptable (with same SI) Rejected (with another SI)	Acceptable
4	1 Data call(active)	1	1	Acceptable	Acceptable
5	1 Speech call(on hold) 1 Speech call(active)	1	2	Rejected	Acceptable
6	1 Speech call(on hold) 1 Data call(active)	1	2	Rejected	Acceptable
7	Multiparty (2-5 remote parties: active)	1	2 - 5	Rejected	Acceptable
8	Multiparty (2-5 remote parties: on hold)	1	2 - 5	Acceptable (with same SI) Rejected (with another SI)	Acceptable
9	1 Speech call(active) 1 Data call(active)	2	2	Rejected	Rejected
10	1 Speech call(on hold) 1 Data call(active)	2	2	Acceptable (with same SI as speech call) Rejected (with another SI)	Acceptable (with same SI as speech call) Rejected (with another SI)
11	1 Speech call(on hold) 1 Speech call(active) 1 Data call(active)	2	3	Rejected	Rejected
12	2 Data call(active)	2	2	Rejected	Rejected
13	1 Speech call(on hold) 2 Data call(active)	2	3	Rejected	Rejected
14	Multiparty (2-5 remote parties: active) 1 Data call(active)	2	3 - 6	Rejected	Rejected
15	Multiparty (2-5 remote parties: on hold) 1 Data call(active)	2	3 - 6	Acceptable (with same SI as speech call) Rejected (with another SI)	Acceptable (with same SI as speech call) Rejected (with another SI)

2. Mobile Terminated Call (MT call)

➢ As an example: N_{br}=2 (CW is not active)

Current Status				Additional MT call	
No	Status	Number of bearers	Number of calls	Speech	Data
1	None	0	0	Offered	Offered
2	1 Speech call(active)	1	1	Busy	Offered
3	1 Speech call(on hold)	1	1	Busy	Offered
4	1 Data call(active)	1	1	Offered	Offered
5	1 Speech call(on hold) 1 Speech call(active)	1	2	Busy	Offered
6	1 Speech call(on hold) 1 Data call(active)	1	2	Busy	Offered
7	Multiparty (2-5 remote parties: active)	1	2 - 5	Busy	Offered
8	Multiparty (2-5 remote parties: on hold)	1	2 - 5	Busy	Offered
9	1 Speech call(active) 1 Data call(active)	2	2	Busy	Busy
10	1 Speech call(on hold) 1 Data call(active)	2	2	Busy	Busy
11	1 Speech call(on hold) 1 Speech call(active) 1 Data call(active)	2	3	Busy	Busy
12	2 Data call(active)	2	2	Busy	Busy
13	1 Speech call(on hold) 2 Data call(active)	2	3	Busy	Busy
14	Multiparty (2-5 remote parties: active) 1 Data call(active)	2	3 - 6	Busy	Busy
15	Multiparty (2-5 remote parties: on hold) 1 Data call(active)	2	3 - 6	Busy	Busy

3. Call Waiting (CW)

➢ As an example: N_{br}=2 (CW is provisioned)

Current Status				Additional MT call	
No	Status	CW status for speech	CW status for data	Speech	Data
1	None	-	-	-	-
2	1 Speech call(active)	active	-	CW offered	MT offered
		Not active	-	busy	MT offered
3	1 Speech call(on hold)	active	-	CW offered	MT offered
		Not active		busy	MT offered

Current Status				Additional MT call	
No	Status	CW status for speech	CW status for data	Speech	Data
4	1 Data call(active)	-	active	MT offered	MT offered
			Not active	MT offered	MT offered
5	1 Speech call(on hold) via bearer A 1 Speech call(active) via bearer A	active	active	CW offered	MT offered
		active	Not active	CW offered	MT offered
		Not active	active	busy	MT offered
		Not active	Not active	busy	MT offered
6	1 Speech call(on hold) via bearer A 1 Data call(active) via bearer A	active	active	CW offered	MT offered
		active	Not active	busy	MT offered
		Not active	active	CW offered	MT offered
		Not active	Not active	busy	MT offered
7	Multiparty via bearer A (2-5 remote parties: active)	active	-	CW offered	MT offered
		Not active	-	Busy	MT offered
8	Multiparty via bearer A (2-5 remote parties: on hold)	active	-	CW offered	MT offered
		Not active	-	busy	MT offered
9	1 Speech call(active) via bearer A 1 Data call(active) via bearer B	active	active	CW offered	CW offered
		active	Not active	CW offered	CW offered
		Not active	active	busy	CW offered
		Not active	Not active	busy	busy
10	1 Speech call(on hold) via bearer A 1 Data call(active) via bearer B	active	active	CW offered	CW offered
		active	Not active	CW offered	CW offered
		Not active	active	busy	CW offered
		Not active	Not active	busy	busy
11	1 Speech call(on hold) via bearer A 1 Speech call(active) via bearer A 1 Data call(active) via bearer B	active	active	CW offered	CW offered
		active	Not active	CW offered	CW offered
		Not active	active	busy	CW offered
		Not active	Not active	busy	busy
12	2 Data call(active)	-	active	CW offered	CW offered
		-	Not active	busy	busy
13	1 Speech call(on hold) via bearer A 2 Data call(active) via bearer A and B	-	active	CW offered	CW offered
		-	Not active	Busy	Busy
14	Multiparty via bearer A (2-5 remote parties: active) 1 Data call(active) via bearer B	active	active	CW offered	CW offered
		active	Not active	CW offered	CW offered
		Not active	active	busy	CW offered
		Not active	Not active	busy	busy
15	Multiparty via bearer A (2-5 remote parties: on hold) 1 Data call(active) via bearer B	active	active	CW offered	CW offered
		active	Not active	CW offered	CW offered
		Not active	active	busy	CW offered
		Not active	Not active	busy	busy

Annex B:

Change history

Change history						
TSG CN#	Spec	Version	CR	<Phase>	New Version	Subject/Comment

History

Document history		
V0.0.1	January 2000	First draft
V0.1.0	February 2000	Addition of the description on handover Modification of Procedure Check_OG_Multicall_MSC
V0.2.0	February 2000	Multicall is defined as supplementary service.
V1.0.0	February 2000	Output from drafting group of multicall adhoc
V0.4.0	February 2000	Including further comments in multicall adhoc. Detail is as follows. - Most of term definitions are removed from section 3.1 because of duplication with 22.135. - Section 4.3.2.8 and 4.3.2.9 are removed since it has been decided not to modify "CAMEL Busy" definition. - Further clarification is included in Table 4.3/2. - The handling of the maximum number of bearers for speech in R99 network is clarified in section 4.3.3. - Some explanatory and clarifying text is added in section 5.3.1. - Stream Identifier error handling is added in Figure 5.3/2 and Figure 5.3/3. - Figure 5.3/4 (Procedure Establish_Terminating_TCH_Multicall 3), Figure 5.3/5 (Procedure Establish_Terminating_TCH_Multicall 4) and their explanatory texts are removed. Because it has been decided to take the CW scenario, where; The UE shall not request a new bearer in Call Confirmed message. The UE shall not request a new bearer beyond the limitation. - Figure 5.3/4 (Process Get_CW_Subscription_Info_Multicall_VLR) and its explanatory text is added in new section 5.3.2. Because it has been concluded that the CW scenario for Multicall shall be described without modification to TS 23.083. - CW invocation condition is removed from section 7.7 because of duplication with 22.135. - Other clarifications were made.

V0.5.0	February 2000	- Replace Figure 5.3/4 to cope with CR against 23.018 and to be more straightforward. - Replace Figure 5.2/1 and 5.2/2 to clarify error cause setting and cope with revised 24.135v0.2.0. - Replace Figure 4.1/2, 4.1/4, 13.2, 13.4 by SDT made files (editorial modification). - Replace N_{br} to N_{br}_SN in section 4.1.7 and Figure 4.1/4 and remove some text regarding N_{br} in section 12 because of the following reason. N_{br}_UE may not be available when the UE is not engaged with any calls. In this case N_{br} can not be calculated. This modification is coped with the requirement in 22.135. - The presence of SI in Connect message in Table 4.3/1 is modified to "C" because Connect message shall not include SI when SI was indicated in Call Confirmed message. - N_{br}_SB in the information element name and its description in 4.3.2.8 and 4.3.2.13 are replaced by N_{br}_User to cope with the requirement, where N_{br}_User is introduced. - Clarification on CC capabilities IE handling in section 4.3.3. - Add text which states UE behaviour toward Multicall not supporting MSC in section 6.1. - Clarification on N_{br}_SN handling after inter MSC handover completion in section 5.2.1 and 5.3.1.
V0.6.0	28.Feb 2000	Editorial corrections with exceptions as follows. - Information element description on the presence of SI in Table 4.3/1 is modified in order to avoid misunderstanding. - Possibility of Multiparty call in ANNEX is modified to "2 - 5 remote parties".
V0.7.0	02 Mar 2000	- Clarification of information elements included in Registration Ack message.
V0.8.0	06 Mar 2000	Editorial corrections with exceptions as follows. - In section 4.2.2, two cases for MT call are split in separate information flows for clarification. - The results of N1#11 meeting and comments raised in NSS e-mail exploder are reflected to message between MS and MSC in section 4.3.1. - Basic service list in Page MS negative response or Search For MS negative response is specified as conditional parameter. (section 4.3.2.9, 4.3.2.15) - Information for UE capability in section 4.3.3 is moved to section 4.3.1.
V0.8.1	07 Mar 2000	Editorial corrections
V1.0.0	08 Mar 2000	- Remove 13.1- 13.4 because of inconsistency with TS 23.009 substance. Section 13 only refer to TS 23.009. For information and approval by CN#7