

3GPP TSG-CN Meeting #23
10th - 12th March 2004, Phoenix, USA

NP-040095

Source: 3GPP TSG CN2
Title: CRs for Rel-6 WI SCCAMEL
Agenda item: 9.14
Document for: APPROVAL

This document contains following CRs for Rel-6 WI SCCAMEL (CAMEL prepay interworking with SCUDIF) that are approved by CN2 and are forwarded to TSG CN#23 for approval:

TDoc #	Title	Ty	Spec	CR	C	R	Rel	Versi	WI
N2-040131	CAMEL4 SCUDIF notification during active call for prepay	CR	29.078	352	B	1	Rel-6	6.0.0	SCCAMEL
N2-040154	CAMEL4 SCUDIF notification during active call for prepay	CR	23.078	688	B	2	Rel-6	6.0.0	SCCAMEL

CR-Form-v7

CHANGE REQUEST

⌘ **29.078 CR 352** ⌘ rev **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ CAMEL4 SCUDIF notification during active call for prepay		
Source:	⌘ Nokia		
Work item code:	⌘ SCCAMEL	Date:	⌘ 17.02.2004
Category:	⌘ B	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ SA1 has approved a service requirement to notify SCP about bearer modification during active call phase. With this change the prepay service can determine the correct tariff for the call.
Summary of change:	⌘ - New EDP-N has been introduced (separate for originating and terminating BCSMs). - When service change is notified to SCP then also ApplyChargingReport is sent, if pending.
Consequences if not approved:	⌘ - SCP can not determine correct tariff - Misalignment to stage 1 (22.078)

Clauses affected:	⌘ 5.1, 11.18.1, 11.27.1										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications	Y	N	X			X		X	⌘ 29.002-CR726, 23.078-CR688	
Y	N										
X											
	X										
	X										
Other comments:	⌘ -										

-- First modified section --**5 Common CAP Types****5.1 Data types**

```

. . .
DpSpecificCriteriaAlt {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    ...
}
-- This datatype is for extension in future releases.

DpSpecificInfoAlt {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    ...
    oServiceChangeSpecificInfo [xx] SEQUENCE {
        ext-basicServiceCode [0] Ext-BasicServiceCode
    } OPTIONAL,
    ...
    tServiceChangeSpecificInfo [xx+1] SEQUENCE {
        ext-basicServiceCode [0] Ext-BasicServiceCode
    } OPTIONAL,
    ...
}
-- This datatype is for extension in future releases.

. . .
EventSpecificInformationBCSM {PARAMETERS-BOUND : bound} ::= CHOICE {
    routeSelectFailureSpecificInfo [2] SEQUENCE {
        failureCause [0] Cause {bound} OPTIONAL,
        ...
    },
    oCalledPartyBusySpecificInfo [3] SEQUENCE {
        busyCause [0] Cause {bound} OPTIONAL,
        ...
    },
    oNoAnswerSpecificInfo [4] SEQUENCE {
        -- no specific info defined --
        ...
    },
    oAnswerSpecificInfo [5] SEQUENCE {
        destinationAddress [50] CalledPartyNumber {bound} OPTIONAL,
        or-Call [51] NULL OPTIONAL,
        forwardedCall [52] NULL OPTIONAL,
        chargeIndicator [53] ChargeIndicator OPTIONAL,
        ext-basicServiceCode [54] Ext-BasicServiceCode OPTIONAL,
        ext-basicServiceCode2 [55] Ext-BasicServiceCode OPTIONAL,
        ...
    },
    oMidCallSpecificInfo [6] SEQUENCE {
        midCallEvents [1] CHOICE {
            dtmfdigitsCompleted [3] Digits {bound},
            dtmfdigitsTimeOut [4] Digits {bound}
        } OPTIONAL,
        ...
    },
    oDisconnectSpecificInfo [7] SEQUENCE {
        releaseCause [0] Cause {bound} OPTIONAL,
        ...
    },
    tBusySpecificInfo [8] SEQUENCE {
        busyCause [0] Cause {bound} OPTIONAL,
        callForwarded [50] NULL OPTIONAL,
        routeNotPermitted [51] NULL OPTIONAL,
        forwardingDestinationNumber [52] CalledPartyNumber {bound} OPTIONAL,
        ...
    },
    tNoAnswerSpecificInfo [9] SEQUENCE {
        callForwarded [50] NULL OPTIONAL,
        forwardingDestinationNumber [52] CalledPartyNumber {bound} OPTIONAL,
        ...
    },
    tAnswerSpecificInfo [10] SEQUENCE {
        destinationAddress [50] CalledPartyNumber {bound} OPTIONAL,
        or-Call [51] NULL OPTIONAL,

```

```

forwardedCall [52] NULL OPTIONAL,
chargeIndicator [53] ChargeIndicator OPTIONAL,
ext-basicServiceCode [54] Ext-BasicServiceCode OPTIONAL,
ext-basicServiceCode2 [55] Ext-BasicServiceCode OPTIONAL,
};
};
tMidCallSpecificInfo [11] SEQUENCE {
midCallEvents [1] CHOICE {
dtmfdigitsCompleted [3] Digits {bound},
dtmfdigitsTimeOut [4] Digits {bound}
} OPTIONAL,
};
};
tDisconnectSpecificInfo [12] SEQUENCE {
releaseCause [0] Cause {bound} OPTIONAL,
};
};
oTermSeizedSpecificInfo [13] SEQUENCE {
locationInformation [50] LocationInformation OPTIONAL,
};
};
callAcceptedSpecificInfo [20] SEQUENCE {
locationInformation [50] LocationInformation OPTIONAL,
};
};
oAbandonSpecificInfo [21] SEQUENCE {
routeNotPermitted [50] NULL OPTIONAL,
};
};
oChangeOfPositionSpecificInfo [50] SEQUENCE {
locationInformation [50] LocationInformation OPTIONAL,
};
};
tChangeOfPositionSpecificInfo [51] SEQUENCE {
locationInformation [50] LocationInformation OPTIONAL,
};
};
dpSpecificInfoAlt [52] DpSpecificInfoAlt {bound} OPTIONAL
}
-- Indicates the call related information specific to the event.

EventSpecificInformationSMS ::= CHOICE {
o-smsFailureSpecificInfo [0] SEQUENCE {
failureCause [0] MO-SMSCause OPTIONAL,
};
};
o-smsSubmissionSpecificInfo [1] SEQUENCE {
-- no specific info defined-
};
};
t-smsFailureSpecificInfo [2] SEQUENCE {
failureCause [0] MT-SMSCause OPTIONAL,
};
};
t-smsDeliverySpecificInfo [3] SEQUENCE {
-- no specific info defined-
};
};
}

EventTypeBCSM ::= ENUMERATED {
collectedInfo (2),
analyzedInformation (3),
routeSelectFailure (4),
oCalledPartyBusy (5),
oNoAnswer (6),
oAnswer (7),
oMidCall (8),
oDisconnect (9),
oAbandon (10),
termAttemptAuthorized (12),
tBusy (13),
tNoAnswer (14),
tAnswer (15),
tMidCall (16),
tDisconnect (17),
tAbandon (18),
oTermSeized (19),
callAccepted (27),
oChangeOfPosition (50),
tChangeOfPosition (51),
...
oServiceChange (52),
tServiceChange (53)
}
-- Indicates the BCSM detection point event.

```

-- Values collectedInfo, analyzedInformation and termAttemptAuthorized may be used
-- for TDPs only.
-- Exception handling: reception of an unrecognized value shall be treated
-- like reception of no detection point.

-- Not modified section, for information --

6 Circuit Switched Call Control

6.1 gsmSSF/CCF - gsmSCF Interface

6.1.1 Operations and arguments

```

InitialDPArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    serviceKey                [0] ServiceKey ,
    calledPartyNumber         [2] CalledPartyNumber {bound} OPTIONAL,
    callingPartyNumber       [3] CallingPartyNumber {bound} OPTIONAL,
    callingPartysCategory    [5] CallingPartysCategory OPTIONAL,
    cGEncountered            [7] CGEncountered OPTIONAL,
    iPSSPCapabilities        [8] IPSSPCapabilities {bound} OPTIONAL,
    locationNumber           [10] LocationNumber {bound} OPTIONAL,
    originalCalledPartyID    [12] OriginalCalledPartyID {bound} OPTIONAL,
    extensions               [15] Extensions {bound} OPTIONAL,
    highLayerCompatibility   [23] HighLayerCompatibility OPTIONAL,
    additionalCallingPartyNumber [25] AdditionalCallingPartyNumber {bound} OPTIONAL,
    bearerCapability         [27] BearerCapability {bound} OPTIONAL,
    eventTypeBCSM            [28] EventTypeBCSM OPTIONAL,
    redirectingPartyID       [29] RedirectingPartyID {bound} OPTIONAL,
    redirectionInformation    [30] RedirectionInformation OPTIONAL,
    cause                    [17] Cause {bound} OPTIONAL,
    serviceInteractionIndicatorsTwo [32] ServiceInteractionIndicatorsTwo OPTIONAL,
    carrier                  [37] Carrier {bound} OPTIONAL,
    cug-Index               [45] CUG-Index OPTIONAL,
    cug-Interlock           [46] CUG-Interlock OPTIONAL,
    cug-OutgoingAccess      [47] NULL OPTIONAL,
    iMSI                    [50] IMSI OPTIONAL,
    subscriberState         [51] SubscriberState OPTIONAL,
    locationInformation      [52] LocationInformation OPTIONAL,
    ext-basicServiceCode    [53] Ext-BasicServiceCode OPTIONAL,
    callReferenceNumber     [54] CallReferenceNumber OPTIONAL,
    mscAddress              [55] ISDN-AddressString OPTIONAL,
    calledPartyBCDNumber    [56] CalledPartyBCDNumber {bound} OPTIONAL,
    timeAndTimezone        [57] TimeAndTimezone {bound} OPTIONAL,
    callForwardingSS-Pending [58] NULL OPTIONAL,
    initialDPArgExtension   [59] InitialDPArgExtension {bound} OPTIONAL,
    ...
}

```

```

InitialDPArgExtension {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    gmscAddress              [0] ISDN-AddressString OPTIONAL,
    forwardingDestinationNumber [1] CalledPartyNumber {bound} OPTIONAL,
    ms-Classmark2           [2] MS-Classmark2 OPTIONAL,
    iMEI                    [3] IMEI OPTIONAL,
    supportedCamelPhases    [4] SupportedCamelPhases OPTIONAL,
    offeredCamel4Functionalities [5] OfferedCamel4Functionalities OPTIONAL,
    bearerCapability2       [6] BearerCapability {bound} OPTIONAL,
    ext-basicServiceCode2   [7] Ext-BasicServiceCode OPTIONAL,
    ...
}

```

```

-- If iPSSPCapabilities is not present then this denotes that a colocated gsmSRF is not
-- supported by the gsmSSF. If present, then the gsmSSF supports a colocated gsmSRF capable
-- of playing announcements via elementaryMessageIDs and variableMessages, the playing of
-- tones and the collection of DTMF digits. Other supported capabilities are explicitly
-- detailed in the IPSSPCapabilities parameter itself.
-- Carrier is included at the discretion of the gsmSSF operator.

```

-- Next modified section --

11 Detailed operation procedures for circuit switched call control

11.18 EventReportBCSM procedure

11.18.1 General description

The gsmSSF uses this operation to notify the gsmSCF of a call related event previously requested by the gsmSCF in a "RequestReportBCSMEvent" operation.

11.18.1.1 Parameters

- eventTypeBCSM:
This parameter specifies the type of event that is reported.
- eventSpecificInformationBCSM:
This parameter indicates the call related information specific to the event.

For Route_Select_Failure it shall contain the "FailureCause", if available.

For O_Busy it shall contain the "BusyCause", if available.

- If the busy event is triggered by an ISUP release message, then the BusyCause is a copy of the ISUP release cause, for example: Subscriber absent, 20 or User busy, 17.
- If the busy event is triggered by a MAP error, for example: Absent subscriber, received from the HLR, then the MAP cause is mapped to the corresponding ISUP release cause.

NOTE 1: If no BusyCause is received, then the gsmSCF shall assume busy.

For T_Busy it may contain the following parameters, if available.

- CallForwarded:
This parameter indicates that the busy event is triggered by call forwarding at the GMSC or VMSC.
- ForwardingDestinationNumber:
This parameter indicates the forwarding destination.
- RouteNotPermitted:
This parameter indicates that the busy event is triggered because call forwarding was not invoked in this GMSC due to the rules of Basic Optimal Routing.
- BusyCause:
 - If the busy event is triggered by an ISUP release message, then the BusyCause is a copy of the ISUP release cause, for example: Subscriber absent, 20 or User busy, 17.
 - If the busy event is triggered by a MAP error, for example: Absent subscriber, received from the HLR, then the MAP cause is mapped to the corresponding ISUP release cause.
 - If the busy event is triggered by call forwarding or call deflection invocation in the GMSC or VMSC, then the BusyCause will refer to the release cause in accordance with the mapping table in 3GPP TS 23.078 [7].

NOTE 2: If no BusyCause is received, then the gsmSCF shall assume busy.

- If the busy event is triggered by call forwarding at the GMSC, then the BusyCause reflects the forwarding reason (Subscriber Absent, 20 or User busy, 17). The eventSpecificInformationBCSM shall in that case also contain the CallForwarded indication.

For O_No_Answer it shall be empty.

For T_No_Answer it may contain the CallForwarded indication and the ForwardingDestinationNumber.

- If the No_Answer event is triggered by an ISUP release message or expiry of the CAMEL timer TNRY, then the eventSpecificInformationBCSM shall be empty.
- If the No_Answer event is triggered by call forwarding at the GMSC or VMSC, then the eventSpecificInformationBCSM shall contain the CallForwarded indication and the ForwardingDestinationNumber.

For O_Answer or T_Answer it shall contain the following information, if available:

- The destination address for the call;
- The OR indicator, in the case that the call was subject to Basic Optimal Routeing, as specified in 3GPP TS 23.079 [8];
- The forwarding indicator, in the case that the Call Forwarding Supplementary Service was invoked;
- The charge indicator;
- The Extended Basic Service Code, for SCUDIF calls (see 3GPP TS 23.172 [16]);
- The Extended Basic Service Code 2, for SCUDIF calls (see 3GPP TS 23.172 [16]).

For O_Mid_Call and T_Mid_Call it shall contain the detected digit string, in accordance with the criterion defined in the RequestReportBCSMEvent operation.

For Call_Accepted, O_Term_Seized, O_Change_Of_Position and T_Change_Of_Position it shall contain the following information:

- locationInformation:
This parameter indicates the location of the MS.

For O_Disconnect and T_Disconnect it shall contain the "releaseCause", if available.

[<CR editor's note: Correct alignment below>](#)

For O_Abandon" it may contain the following parameter, if available.

- routeNotPermitted:
This parameter indicates that the O-Abandon event is triggered because call set up shall not be invoked in this MSC due to the rules of Basic Optimal Routeing.
- legID:
This parameter indicates the party in the call for which the event is reported. The gsmSSF shall use the option "receivingSideID" only.
- receivingSideID:
If not included, then the following defaults values for LegID are assumed according to the tables 11-1 and 11-2:
 - "legID" = 1 for the events O_Abandon and T_Abandon;
 - "legID" = 2 for the events Route_Select_Failure, O_Busy, O_No_Answer, O_Answer, T_Busy, O_Term_Seized, Call_Accepted, T_No_Answer and T_Answer.

The "legID" parameter shall always be included for the events O_Disconnect and T_Disconnect.

- miscCallInfo:
This parameter indicates Detection Point (DP) related information.

- messageType:
This parameter indicates whether the message is a request, i.e. resulting from a "RequestReportBCSMEvent" with monitorMode = interrupted, or a notification, i.e. resulting from a "RequestReportBCSMEvent" with "monitorMode" = "notifyAndContinue".

For O_Service_Change or T_Service_Change it may contain the following information:

- The Extended Basic Service Code, for SCUDIF calls (see 3GPP TS 23.172 [16]):

11.18.2 Invoking entity (gsmSSF)

11.18.2.1 Normal procedure

gsmSSF preconditions:

- (1) A control relationship or a monitoring relationship exists between the gsmSSF and the gsmSCF.
- (2) For the O_Disconnect DP, T_Disconnect DP, O_Answer DP and T_Answer DP, the gsmSSF FSM is in the state "Monitoring" or in the state "Waiting_for_Instructions". For the O_Abandon DP and T_Abandon DP, the gsmSSF FSM is in any state, except "Idle".
- (3) The BCSM proceeds to an EDP that is armed.

gsmSSF postconditions:

- (1) If the message type was notification and there are still armed EDPs or pending reports, then the gsmSSF FSM stays in the state "Monitoring".
- (2) If the message type was notification and there are neither any armed EDPs nor pending reports, then the gsmSSF FSM transits to the state "Idle".
- (3) If the message type was request, then the gsmSSF FSM transits to the state "Waiting_for_Instructions". Call processing is interrupted.

11.18.2.2 Error handling

If the message type is "request" and the Tssf timer expires, then the gsmSSF shall abort the TC dialogue and shall instruct the MSC to treat the call in accordance with the Default Call Handling, valid for this CAMEL dialogue.

Operation related error handling is not applicable, due to class 4 operation.

-- Next modified section --

11.27 RequestReportBCSMEvent procedure

11.27.1 General description

The gsmSCF uses this operation to request the gsmSSF to monitor for a call-related event (e.g., BCSM events such as O_Busy or O_No_Answer) and to send a notification to the gsmSCF when the event is detected.

The monitoring of more than one event may be requested with a single "RequestReportBCSMEvent" operation, but each of these requested events will be reported in a separate "EventReportBCSM" operation.

NOTE: If the RequestReportBCSMEvent requests arming of the current DP from which the call processing was suspended, then the next occurrence of the DP encountered during BCSM processing will be detected (i.e. not the current one from which the call was suspended).

The DP arming principle is as follows:

- The DPs O_Disconnect and T_Disconnect can be armed for any or all legs depending on the direction for which events have to be captured. As an example, the O_Disconnect DP can be armed for leg1 and leg2; in this case, if a release request is received from the A-party, then it will be detected by the O_Disconnect DP armed for leg1, while a release request from the B-party will be detected by the O_Disconnect DP armed for leg2.
- The O_Abandon DP can be armed only for leg1 in the O-BCSM and the T_Abandon DP can be armed only for leg1 in the T-BCSM.

Table 11-1: DP Arming Table for O-BCSM:

O-BCSM	leg1	Not leg 1	Default leg ID
O_Term_Seized DP	-	X	2
Route_Select_Failure DP	-	X	2
O_Busy DP	-	X	2
O_No_Answer DP	-	X	2
O_Answer DP	-	X	2
O_Disconnect DP	X	X	- (note 1)
O_Abandon DP	X	-	1
O_Mid_Call	X	-	1
O_Change_Of_Position	X	-	1
<u>O_Service_Change</u>	<u>X</u>	<u>-</u>	<u>1</u>
Note 1: The "legID" parameter shall be included Nomenclature: X = Arming Applicable - = Arming not Applicable			

Table 11-2: DP Arming Table for T-BCSM:

T-BCSM	leg2	leg1	Default Leg ID
Call_Accepted DP	X	-	2
T_Busy DP	X	-	2
T_No_Answer DP	X	-	2
T_Answer DP	X	-	2
T_Disconnect DP	X	X	- (note 1)
T_Abandon DP	-	X (note 2)	1
T_Mid_Call	X	-	2
T_Change_Of_Position	X	-	2
<u>T_Service_Change</u>	<u>X</u>	<u>-</u>	<u>2</u>
Note 1: The "legID" parameter shall be included Note 2: T_Abandon can be armed for leg1 only. Nomenclature: X = Arming Applicable - = Arming not Applicable			

11.27.1.1 Parameters

- bcsmEvents:
This parameter specifies the event or events of which a report is requested.
- eventTypeBCSM:
This parameter specifies the type of event of which a report is requested.
- monitorMode:
This parameter indicates how the event shall be reported. If the "monitorMode" is "interrupted", then the event shall be reported as a request; if the "monitorMode" is "notifyAndContinue", then the event shall be reported as a notification; if the "monitorMode" is "transparent", then the event shall not be reported.
- legID:
This parameter indicates the party in the call for which the event shall be reported. The gsmSCF shall use the option "sendingSideID" only.
- sendingSideID:

If not included, then the following defaults values for LegID are assumed for LegID according to the tables 11-1 and 11-2:

~~"legID" = 1 for the events O_Abandon, T_Abandon and O_Mid_Call,~~

~~"legID" = 2 for the events Route_Select_Failure, O_Busy, O_No_Answer, O_Answer, T_Busy, O_Term_Seized, Call_Accepted, T_No_Answer, T_Answer and T_Mid_Call.~~

The "legID" parameter shall always be included for the events O_Disconnect and T_Disconnect.

- dPSpecificCriteria:
This parameter contains information specific to the EDP that shall be armed.
 - applicationTimer:
This parameter indicates the No_Answer timer value for the No_Answer event. If the called party does not answer the call within the allotted time, then the gsmSSF shall report the event to the gsmSCF. This timer shall be shorter than the network No_Answer timer.
 - midCallControlInfo:
This parameter defines the criterion for the detection and reporting of mid-call digits. If this parameter is absent, then the first digit entered shall be reported.
- automaticRearm:
This parameter indicates that the gsmSSF shall rearm the DP whenever it is encountered.

11.27.2 Responding entity (gsmSSF)

11.27.2.1 Normal procedure

gsmSSF preconditions:

- (1) A control relationship exists between the gsmSSF and the gsmSCF.
- (2) The gsmSSF FSM is in the state "Waiting_for_Instructions" or in the state "Monitoring".

NOTE: In the state "monitoring" only requests to disarm detection points (with MonitorMode set to "Transparent") or to send notifications of events (with MonitorMode set to "NotifyAndContinue") shall be accepted by the gsmSSF.

gsmSSF postconditions:

- (1) The requested EDPs are armed or disarmed as indicated.
- (2) Previously requested events are monitored until ended by a transparent monitor mode, until the end of the call, until the EDPs are detected or until the corresponding leg is released.

- (3) The gsmSSF FSM remains in the same state, unless all EDPs have been disarmed and no CallInformationReport or ApplyChargingReport has been requested; in the latter case, the gsmSSF FSM transits to the state "Idle".

11.27.2.2 Error handling

Generic error handling for the operation related errors are described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

CHANGE REQUEST

⌘ **23.078 CR 688** ⌘ rev **2** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ CAMEL4 SCUDIF notification during active call for prepay		
Source:	⌘ Nokia		
Work item code:	⌘ SCCAMEL	Date:	⌘ 20.02.2004
Category:	⌘ B	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories: <i>F</i> (correction) <i>A</i> (corresponds to a correction in an earlier release) <i>B</i> (addition of feature), <i>C</i> (functional modification of feature) <i>D</i> (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ SA1 has approved a service requirement to notify SCP about bearer modification during active call phase. With this change the prepay service can determine the correct tariff for the call.
Summary of change:	⌘ - New EDP-N has been introduced (separate for originating and terminating BCSMs). - When service change is notified to SCP then also ApplyChargingReport is sent, if pending.
Consequences if not approved:	⌘ - SCP can not determine correct tariff - Misalignment to stage 1 (22.078)

Clauses affected:	⌘ 1.1.2, 4.4.2.1, 4.4.3.1, 4.4.4, 4.5.2.1, 4.5.3.1, 4.5.4.1, 4.5.5, 4.5.7.5, 4.6.1.6.2, 4.6.1.8.2, 4.6.2.19.2										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications	Y	N	X			X		X	⌘ 29.002-CR726, 29.078-CR352	
Y	N										
X											
	X										
	X										
Other comments:	⌘ - In this version failures of bearer modification are not described. To be decided if it is necessary.										

-- First modified section --

1.1.2 CAMEL Phase 4 Functionalities

The CAMEL phase 4 functionalities which may be offered to the gsmSCF are the following:

- Creating additional parties in a call, Creating a new call (Initiate Call Attempt);
- Placing an individual call party on hold or moving an individual call party to Call Segment 1, when Call Segment 1 does not exist (Split Leg);
- Connecting an individual call party to the group (Move Leg);
- Releasing an individual call party (Disconnect Leg);
- Indication of the release of a call party or call segment (Entity Released);
- Enhancements for subscriber interactions with the gsmSCF (Disconnect Forward Connection With Argument);
- Inclusion of flexible tone injection (Play Tone);
- DTMF Mid call procedure for MO and VT calls (DP O_Mid_Call, DP T_Mid_Call);
- Provision of Charge Indicator at answer DP (Charge Indicator at DP O_Answer, DP T_Answer);
- Support of Alerting DP (DP O_Term_Seized, DP Call_Accepted);
- Provision of location information of subscriber at alerting DP (Location information at DP O_Term_Seized, DP Call_Accepted);
- Provision of location information during an ongoing call (DP O_Change_Of_Position, DP T_Change_Of_Position);
- Interactions with Basic Optimal Routeing (Basic OR Interrogation Requested in Connect and Continue With Argument, Route Not Permitted in DP O_Abandon);
- Warning tone enhancements (Burstlist for Audible Indicator); ~~and~~
- Enhancements of Call Forwarding indication (Forwarding Destination Number); and
- SCUDIF notification during active phase of the call (DP O_Service_Change and T_Service_Change).

A functional entity (VMSC or GMSC) may offer the functionalities in any combination applicable for this entity and applicable to the offered CSIs.

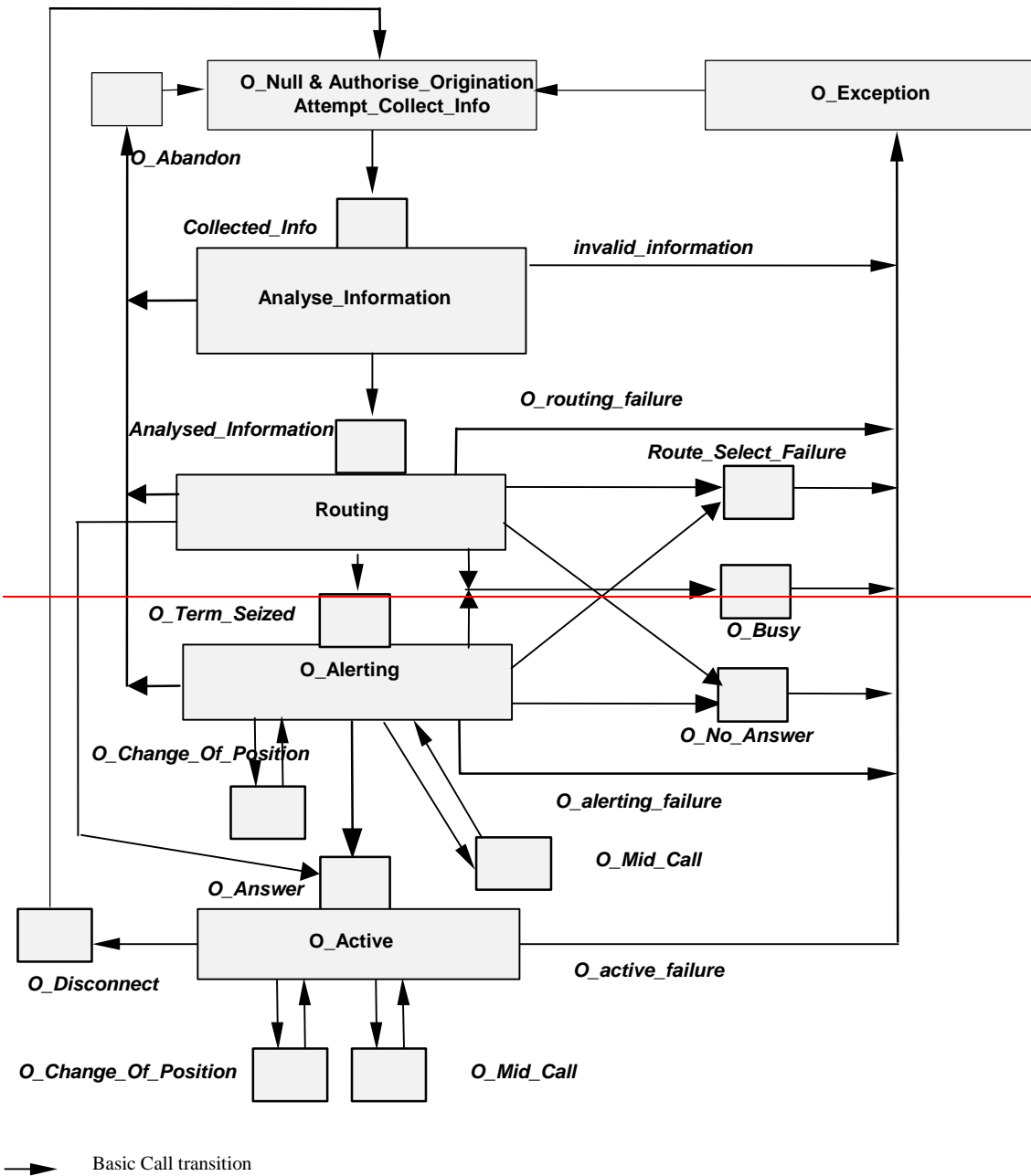
A functional entity (VMSC or GMSC) shall indicate to the gsmSCF all the functionalities it offers.

-- Next modified section --

4.4.2.1 Description of O-BCSM

The O-BCSM is used to describe the actions in an MSC during originating (MSC) or forwarded (MSC or GMSC) calls.

When encountering a DP the O-BCSM processing is suspended at the DP and the MSC or GMSC indicates this to the gsmSSF which determines what action, if any, shall be taken if the DP is armed. For gsmSCF initiated new calls the O-BCSM is initially suspended at DP Collected_Info.



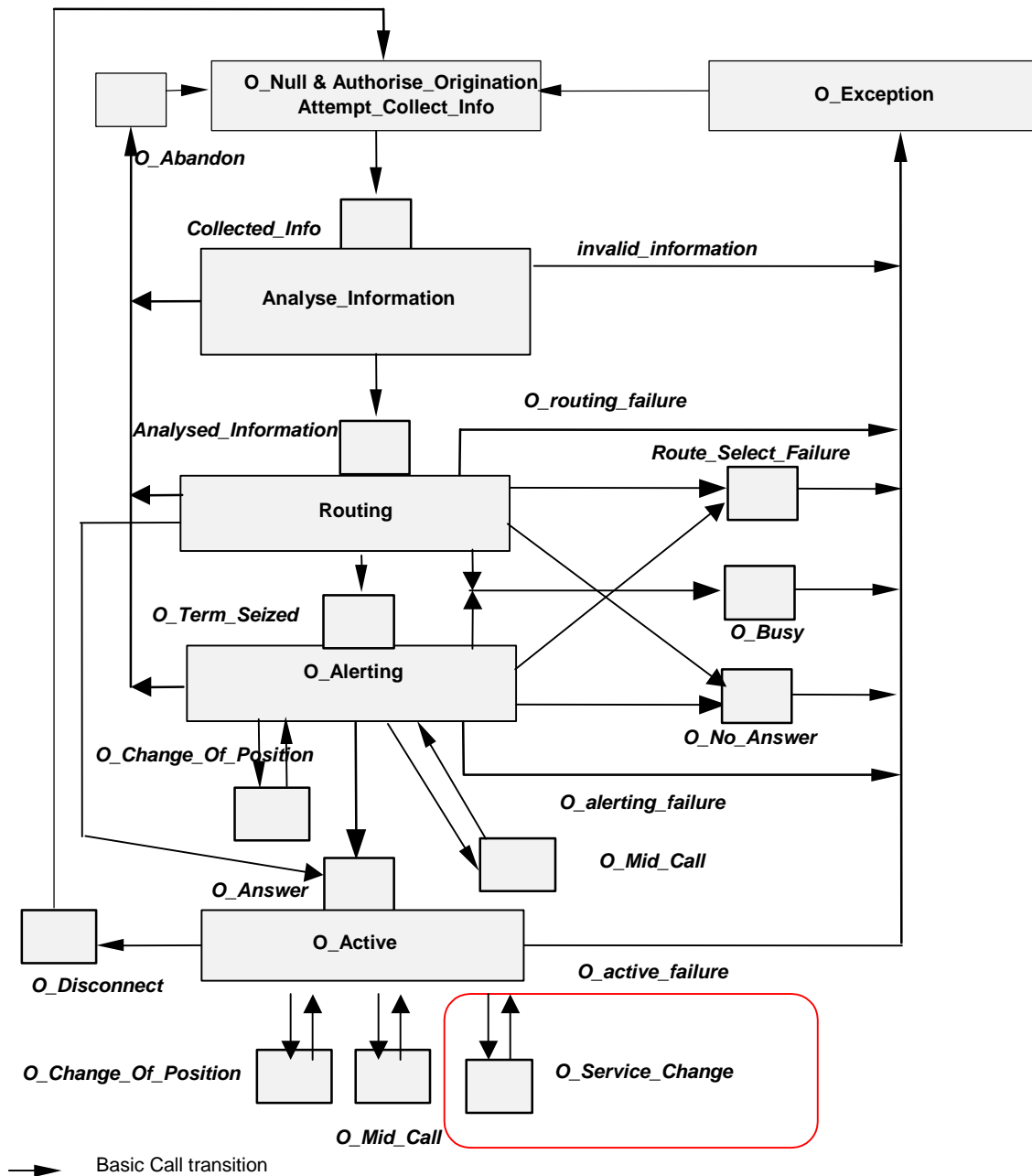


Figure 4.3: Originating BCSM for CAMEL

The table below defines the different DPs which apply to mobile originating and forwarded calls.

Table Error! Reference source not found..1: Description of O-BCSM DPs in the MSC

CAMEL Detection Point:	DP Type	Description:
DP Collected_Info	TDP-R	Indication that the O-CSI is analysed or the gsmSCF has initiated a call attempt. In the later case the DP is neither triggered nor reported.
DP Analysed_Information	TDP-R (note 2)	Availability of routeing address and nature of address.
DP Route_Select_Failure	TDP-R (note 3), EDP-N, EDP-R	Indication that the call establishment failed.
DP O_Busy	EDP-N, EDP-R	Indication that: - a busy indication is received from the terminating party, - a not reachable event is determined from a cause IE in the ISUP Release message.
DP O_No_Answer	EDP-N, EDP-R	Indication that: - an application timer associated with the O_No_Answer DP expires, - a no answer event is determined from a cause IE in the ISUP Release message.
DP O_Term_Seized	EDP-N, EDP-R	Indication that the called party is being alerted.
DP O_Answer	EDP-N, EDP-R	Indication that the call is accepted and answered by the terminating party.
DP O_Mid_Call	EDP-N, EDP-R	Indication that a service/service feature indication is received from the originating party (DTMF - note 4, note 5).
DP O_Change_Of_Position	EDP-N	Indication that the originating party has changed position.
DP O_Disconnect	EDP-N, EDP-R	A disconnect indication is received from the originating party or from the terminating party.
DP O_Abandon	EDP-N, EDP-R	Indication that a disconnect indication is received from the originating party during the call establishment procedure.
DP O Service Change	EDP-N	Indication that the bearer service has changed.
NOTE 1: The DPs are defined in ITU-T Recommendation Q.1224 [Error! Reference source not found.].		
NOTE 2: For TDP-R Analysed_Information new relationship to gsmSCF is opened.		
NOTE 3: DP Route_Select_Failure shall be reported as TDP-R when there is no relationship to gsmSCF. If a relationship to gsmSCF is already open, it shall be reported as EDP-R or EDP-N if armed so.		
NOTE 4: DTMF is only applicable for the Mobile Originating Call in the VMSC.		
NOTE 5: Call Processing is suspended at DP O_Mid_Call if a Call Party Handling information flow is handled. However, the DP is not reported.		

4.4.2.1.1 Description of the call model (PICs)

This subclause describes the call model for originating and forwarded calls. For each PIC a description can be found of the entry events, functions and exit events.

It should be noted that although the names used for PICs match those used in ITU-T Recommendation Q.1224 [44] the specific descriptions differ.

4.4.2.1.1.1 O_Null & Authorise_Origination_Attempt_Collect_Info

Entry events:

- Disconnection and clearing of a previous call (DP O_Disconnect) or default handling of exceptions by gsmSSF/(G)MSC completed.
- Abandon event is reported from Analyse_Information or Routing and Alerting PIC.
- Exception event is reported.

Actions:

- Interface is idled.
- Originating call: SETUP information flow containing the dialled number is received from MS.
- Originating call: The supplementary service "barring of all outgoing calls" is checked and invoked if necessary.
- Originating call: The ODB category "barring of all outgoing calls" is checked and ODB is invoked if necessary.

NOTE: the ODB category "barring of all outgoing calls when roaming" causes the HLR to send the category "barring of all outgoing call" if the VLR is not in the HPLMN.

- Originating call: CUG checks done in the originating MSC/VLR are performed.
- Information being analysed e.g., O-CSI is analysed.

Exit events:

- Originating CSI is analysed.
- An exception condition is encountered. For this PIC, if the call encounters one of these exceptions during the PIC processing, the exception event is not visible because there is no corresponding DP. Example exception condition: Calling party abandons call.

4.4.2.1.1.2 Analyse_Information

Entry events:

- Originating CSI is analysed. (DP Collected Info).
- The gsmSCF has initiated a call attempt (DP Collected_Info). In this case the DP has neither been triggered nor has it been reported.
- New routing information is received when the Busy event (DP O_Busy), Route Select Failure event (DP Route_Select_Failure), Not Reachable event (DP O_Busy) or No Answer event (DP O_No_Answer) is reported from the Routing and Alerting PIC.
- New routing information is received when the Disconnect event is reported from the O_Active PIC.

Actions:

- Compare the called party number with the dialled services information.

Exit events:

- Availability of routing address and nature of address. (DP Analysed_Information).
- An exception condition is encountered (e.g. wrong number); this leads to the O_Exception PIC.
- The calling party abandons the call; this leads to the O_Abandon DP.

4.4.2.1.1.3 Routing

Entry events:

- Availability of routing address and nature of address. (DP Analysed_Information).

Actions:

- Information is being analysed and/or translated according to dialling plan to determine routing address.
- Routing address being interpreted.
- Originating call: Outgoing barring services and ODB categories not already applied are checked and invoked if necessary.

Exit events:

- An indication is received from the terminating half BCSM that the call is accepted and answered by the terminating party; this leads to O_Answer DP.
- An exception condition is encountered; this leads to the O_Exception PIC.
- The calling party abandons the call; this leads to the O_Abandon DP.
- A busy indication is received from the terminating party; this leads to the O_Busy DP.

- A not reachable indication is received from the terminating party; this leads to the O_Busy DP.
- The attempt to select the route for the call fails; this leads to the Route_Select_Failure DP.
- An alerting indication (ISUP ACM) is received from the terminating party; this leads to the O_Term_Seized DP.
- The no reply timer expires; this leads to the O_No_Answer DP.

4.4.2.1.1.4 O_Alerting

Entry events:

- Called Party is being alerted (DP O_Term_Seized).
- Continue is received in O_Mid_Call DP.

Actions:

- Call is being processed by the terminating half BCSM. Waiting for indication from terminating half BCSM that the call has been answered by terminating party.
- Send a notification to the gsmSCF if the originating party changes position and DP O_Change_Of_Position is armed.

Exit events:

- A service/service feature request is received from the originating party (DTMF) or DP O_Mid_Call is used for Call Party Handling; this leads to the O_Mid_Call DP.
- An indication is received from the terminating half BCSM that the call is accepted and answered by the terminating party; this leads to the O_Answer DP.
- An exception condition is encountered; this leads to the O_Exception PIC.
- The calling party abandons the call; this leads to the O_Abandon DP.
- A route select failure indication is received from the terminating party; this leads to the Route_Select_Failure DP.
- A busy indication (UDUB) is received from the terminating party; this leads to the O_Busy DP.
- A not reachable indication is received from the terminating party; this leads to the O_Busy DP.
- The no reply timer expires; this leads to the O_No_Answer DP.

4.4.2.1.1.5 O_Active

Entry events:

- Indication from the terminating half BCSM that the call is accepted and answered by the terminating party. (DP O_Answer)
- Continue is received in O_Mid_Call DP.

Actions:

- Connection established between originating party and terminating party. Call supervision is provided.
- Send a notification to the gsmSCF if the originating party changes position and DP O_Change_Of_Position is armed.
- [Send a notification to the gsmSCF if the bearer is changed due to the SCUDIF and DP O_Service_Change is armed.](#)
- Call release is awaited.

Exit events:

- A service/service feature request is received from the originating party (DTMF) or DP O_Mid_Call is used for Call Party Handling (DP O_Mid_Call).
- A disconnection indication is received from the originating party, or received from the terminating party via the terminating half BCSM (DP O_Disconnect).
- An exception condition is encountered.

4.4.2.1.1.6 O_Exception

Entry events:

- An exception condition is encountered. In addition to specific examples listed above, exception events include any type of failure, which means that the normal exit events for a PIC can not be met.

Actions:

- Default handling of the exception condition is being provided. This includes general actions necessary to ensure that no resources remain inappropriately allocated such as:
 - If any relationship exists between the gsmSSF and the gsmSCF, the gsmSSF shall send an error information flow closing the relationships and indicating that any outstanding call handling instructions will not run to completion.
 - The (G)MSC/gsmSSF should make use of vendor-specific procedures to ensure release of resources within the (G)MSC/gsmSSF, so that line, trunk and other resources are made available for new calls.

Exit events:

- Default handling of the exception condition by gsmSSF/(G)MSC completed.

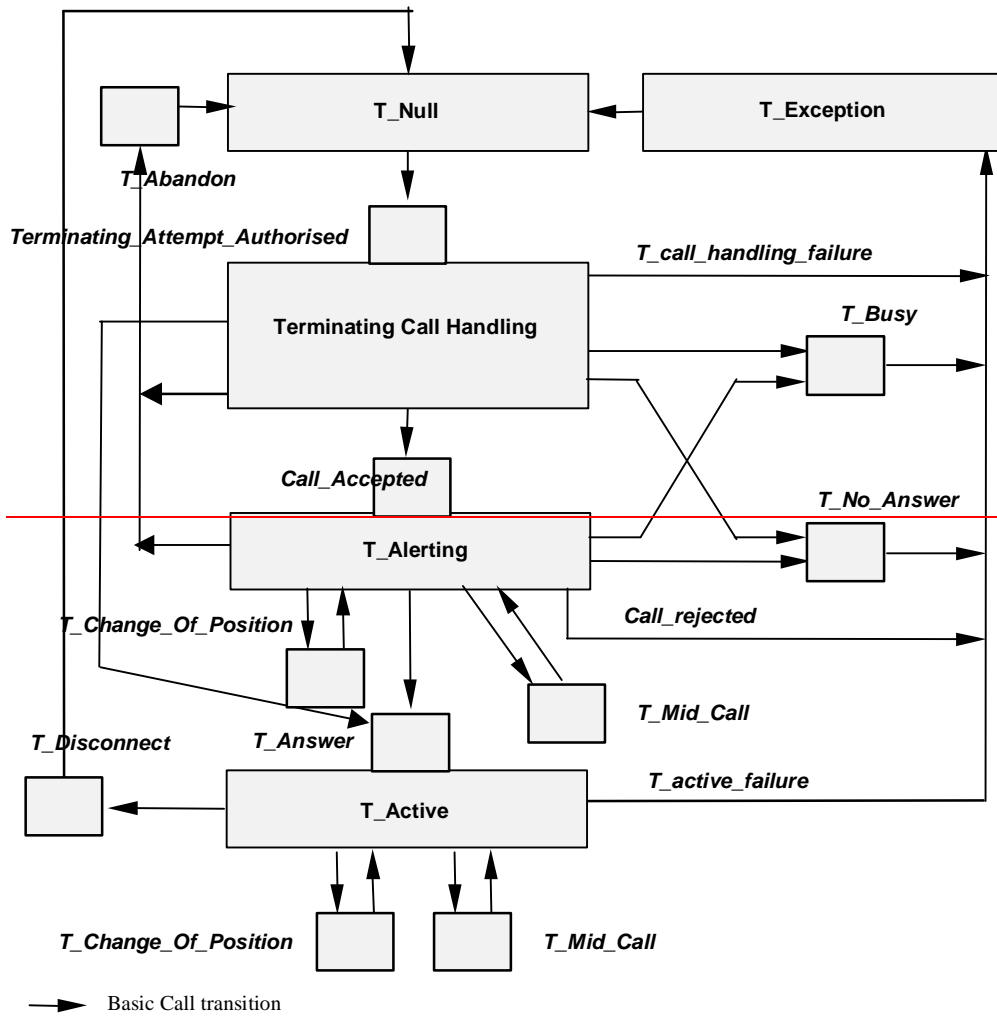
-- Next modified section --

4.4.3 Terminating Basic Call State Model (T-BCSM)

4.4.3.1 Description of T-BCSM

The T-BCSM is used to describe the actions in a GMSC and in a VMSC during terminating calls.

When encountering a DP the T-BCSM processing is suspended at the DP and the GMSC or VMSC indicates this to the gsmSSF which determines what action, if any, shall be taken if the DP is armed.



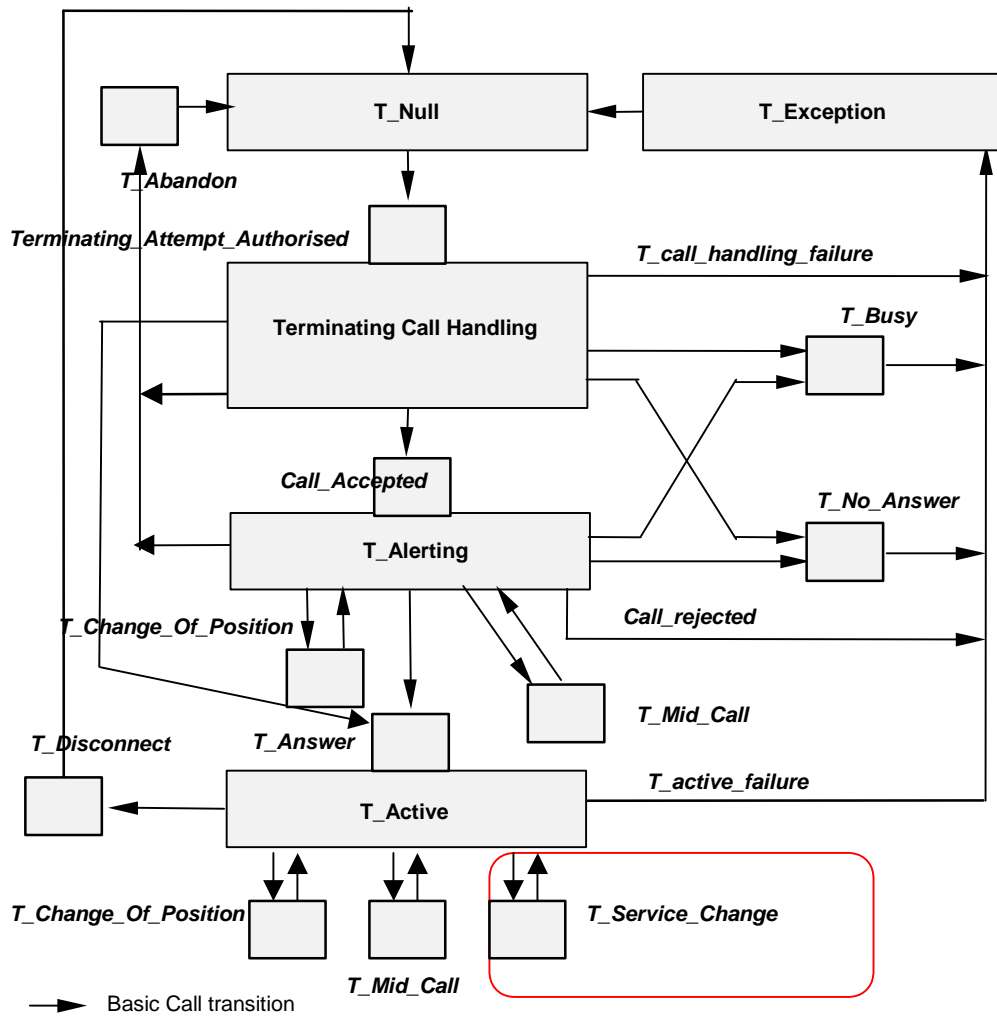


Figure 4.4: T-BCSM in the GMSC or VMSC

In the table below the different DPs (in the T-BCSM) are described.

Table Error! Reference source not found..2: Description of T-BCSM DPs in the GMSC or VMSC

CAMEL Detection Point:	DP Type	Description:
DP Terminating_Attempt_Authorised	TDP-R	Indication that the T-CSI / VT-CSI is analysed.
DP T_Busy	TDP-R (note 2), EDP-N, EDP-R	Indication that: <ul style="list-style-type: none"> - a busy indication is received from the destination exchange, - Busy event is determined in the visited MSC, - Not reachable or call establishment failure event is determined from the HLR response or upon a cause IE in the ISUP Release message.
DP T_No_Answer	TDP-R (note 2), EDP-N, EDP-R	Indication that an application timer associated with the T_No_Answer DP expires.
DP Call_Accepted	EDP-N, EDP-R	Indication that the called party is being alerted.
DP T_Answer	EDP-N, EDP-R	Call is accepted and answered by terminating party.
DP T_Mid_Call	EDP-N, EDP-R	Indication that a service/service feature is received from the terminating party (DTMF - note 3, note 4).
DP T_Change_Of_Position	EDP-N	Indication that the terminating party has changed position.
DP T_Disconnect	EDP-N, EDP-R	A disconnect indication is received from the terminating party or from the originating party.
DP T_Abandon	EDP-N, EDP-R	A disconnect indication is received from the originating party during the call establishment procedure.
DP T_Service_Change	EDP-N	Indication that the bearer service has changed.
NOTE 1: The DPs are defined in ITU-T Recommendation Q.1224 [Error! Reference source not found.].		
NOTE 2: DP T_No_Answer and DP T_Busy shall be reported as TDP-R when there is no relationship to gsmSCF. If a relationship to gsmSCF is already open, it shall be reported as EDP-R or EDP-N if armed so.		
NOTE 3: DTMF is only applicable for the VMSC but not for the GMSC. DTMF is not applicable at the T_Alerting PIC.		
NOTE 4: Call Processing is suspended at DP T_Mid_Call if a Call Party Handling information flow is handled. However, the DP is not reported.		

4.4.3.1.1 Description of the call model (PICs)

This subclause describes the call model for terminating calls in the GMSC and in the VMSC. For each PIC a description can be found of the entry events, functions, information available and exit events.

It should be noted that although the names used for PICs match those used in ITU-T Recommendation Q.1224 [44] the specific descriptions differ.

4.4.3.1.1.1 T_Null

Entry events:

- Disconnection and clearing of a previous call (DP T_Disconnect) or default handling of exceptions by gsmSSF/GMSC or VMSC completed.
- Abandon event is reported from Terminating Call Handling PIC.
- Exception event is reported.

Actions:

- Interface is idled.
- If ISUP Initial Address Message is received, the appropriate information is analysed.
- If the T-BCSM is in the GMSC, a Send Routeing Info information flow is sent to the HLR.
- If the T-BCSM is in the VMSC, a Send Info For Incoming Call information flow is sent to the VLR.
- If the T-BCSM is in the GMSC:
 - The supplementary services "barring of all incoming calls" and "barring of incoming calls when roaming" are checked in the HLR and invoked if necessary.

- The ODB categories "barring of all incoming calls" and "barring of incoming calls when roaming" are checked in the HLR and ODB is invoked if necessary.
- The supplementary service "CUG" is checked in the HLR and invoked if necessary.
- T-CSI/VT-CSI is received and analysed.

Exit events:

- Response is received from HLR or VLR and terminating CSI (if available) is analysed.
- An exception condition is encountered. For this PIC, if the call encounters one of these exceptions during the PIC processing, the exception event is not visible because there is no corresponding DP.

Example exception condition is:

- The calling party abandons call.

4.4.3.1.1.2 Terminating Call Handling

Entry events:

- Response is received from HLR or VLR and terminating CSI (if available) is analysed (DP Terminating_Attempt_Authorised).
- New routing information is received when a Busy or not reachable event (DP T_Busy) or a No Answer event (DP T_No_Answer) is reported from the Terminating Call Handling PIC.
- New routing information is received when a Disconnect event is reported from the T_Active PIC.

NOTE: The HLR may use MAP signalling to indicate to the GMSC before the call is extended to the destination VMSC that the terminating party is not reachable, or the destination VMSC may use telephony signalling to indicate to the GMSC after the call has been extended to the destination VMSC that the terminating party is not reachable.

Actions:

- The response from the HLR or VLR is analysed.
- Routing address and call type are interpreted. The next route or terminating access is selected.
- The Call Forwarding supplementary service is invoked if necessary.

Exit events:

- The call is accepted and answered by terminating party; this leads to the T_Answer DP.
- An indication is received that the called party is being alerted; this leads to the Call_Accepted DP.
- An exception condition is encountered; this leads to the T_Exception PIC. Example exception conditions: the call setup to the MSC or GMSC was not successful.
- The calling party abandons the call; this leads to the T_Abandon DP.
- The terminating access is busy in the VMSC or a busy indication is received from the destination exchange in the GMSC; this leads to the T_Busy DP.
- A not reachable event detected or failure of attempt to select the route for the terminating leg in the GMSC fails or the MS cannot be reached in the VMSC; this leads to the T_Busy DP.
- The no reply timer expires; this leads to the T_No_Answer DP.

4.4.3.1.1.3 T_Alerting

Entry events:

- Called party is being alerted (DP Call_Accepted)
- Continue is received in T_Mid_Call DP.

Actions:

- Waiting for the call to be answered by terminating party.
- The Call Forwarding supplementary service is invoked if necessary.
- Send a notification to the gsmSCF if the terminating party changes position and DP T_Change_Of_Position is armed.

Exit events:

- The call is accepted and answered by terminating party; this leads to the T_Answer DP.
- An exception condition is encountered; this leads to the T_Exception PIC. Example exception conditions: the call setup to the MSC or GMSC was not successful.
- The calling party abandons the call; this leads to the T_Abandon DP.
- A busy indication (UDUB) is received from the destination exchange; this leads to the T_Busy DP.
- A not reachable event is detected or the attempt to select the route for the terminating leg in the GMSC fails or the MS cannot be reached in the VMSC; this leads to the T_Busy DP.
- The no reply timer expires; this leads to the T_No_Answer DP.
- A Call Party Handling information flow is executed; this leads to the T_Mid_Call DP.

4.4.3.1.1.4 T_Active

Entry events:

- Indication that the call is accepted and answered by the terminating party. (DP T_Answer).
- Continue is received in T_Mid_Call DP.

Actions:

- Connection established between originating party and terminating party. Call supervision is being provided.
- Send a notification to the gsmSCF if the terminating party changes position and DP T_Change_Of_Position is armed.
- Send a notification to the gsmSCF if the bearer is changed due to the SCUDIF and DP T_Service_Change is armed.
- Wait for call release.

Exit events:

- A disconnection indication is received from the terminating party, or received from the originating party via the originating half BCSM; this leads to the T_Disconnect DP.
- An exception condition is encountered. In addition to the specific examples listed above, exception events include any type of failure that means that the normal exit events for a PIC cannot be met.
- A service/service feature request is received from the called party (DTMF) or a Call Party Handling information flow is executed; this leads to the T_Mid_Call DP.

4.4.3.1.1.5 T_Exception

Entry events:

- An exception condition is encountered. In addition to the specific examples listed above, exception events include any type of failure, which means that the normal exit events for PIC cannot be met.

Actions:

- Default handling of the exception condition is being provided. This includes general actions necessary to ensure that no resources remain inappropriately allocated such as:
 - If any relationship exists between the gsmSSF and the gsmSCF, the gsmSSF shall send an error information flow closing the relationships and indicating that any outstanding call handling instructions will not run to completion.
 - The GMSC or VMSC / gsmSSF should make use of vendor-specific procedures to ensure release of resources within the GMSC or VMSC / gsmSSF, so that line, trunk and other resources are made available for new calls.

Exit events:

- Default handling of the exception condition by gsmSSF/GMSC is completed.

-- Next modified section --

4.4.4 Rules for Implicit Disarming of Event Detection Points

The tables below give the rules for implicit disarming of event detection points.

Implicit EDP disarming rules are specified in the tables below for Originating BCSM and Terminating BCSM respectively. Each table specifies which EDP's shall be disarmed (i.e. MonitorMode set to Transparent) if/when each EDP is encountered, irrespective of the EDP's Monitor Mode (Transparent, Notify And Continue, or Request).

When EDPs armed with MonitorMode 'Request' (EDP-Rs) are encountered, any implicit EDP disarming shall take place before reporting the EDP and transiting the gsmSSF to the Waiting_For_Instruction state (if not already suspended in the Waiting_For_Instruction state).

If the BCSM has encountered DP O/T_Answer then an originator release must be detected as a DP O/T_Disconnect.

The table entry 'X' means that if the DP is encountered (independently of arming and reporting to the gsmSCF) the marked DP is implicitly disarmed.

It shall be possible to rearm explicitly an implicitly disarmed DP, e.g. for follow on call.

Table Error! Reference source not found..3: Implicit disarmed DPs in the O-BCSM

Encountered DP	Implicit disarmed DPs										
	Route_Select_Failure	O_Busy	O_No_Answer	O_Answer	O_Mid_Call Leg 1	O_Disconnect Leg 1	O_Disconnect any other Leg	O_Abandon	O_Term_Seized	O_Change_Of_Position	O_Service_Change
Route_Select_Failure	X	X	X	X			X		X		
O_Busy	X	X	X	X			X		X		
O_No_Answer	X	X	X	X			X		X		
O_Answer	X	X	X	X				X	X		
O_Mid_Call Leg 1 (note 1)					X						
O_Disconnect Leg 1					X	X		X		X	X
O_Disconnect any other Leg	X	X	X	X			X		X		
O_Abandon					X	X		X		X	X
O_Term_Seized									X		
O_Change_Of_Position (note 1)										X	
O_Service_Change (note 1)											X
Note 1	If the Automatic Rearm IE was present in the Request Report BCSM Event information flow for the O_Change_Of_Position DP, O_Service_Change DP or the O_Mid_Call DP and armed as EDP-N, then the DP shall be automatically rearmed by the gsmSSF when it is encountered.										

Table Error! Reference source not found..4: Implicit disarmed DPs in the T-BCSM

Encountered DP	Implicit disarmed DPs									
	T_Busy	T_No_Answer	T_Answer	T_Mid_Call Leg 2	T_Disconnect any other Leg	T_Disconnect Leg 2	T_Abandon	Call_Accepted	T_Change_Of_Position	T_Service_Change
T_Busy	X	X	X	X		X		X	X	X
T_No_Answer	X	X	X	X		X		X	X	X
T_Answer	X	X	X				X	X		
T_Mid_Call Leg 2 (note 1)				X						
T_Disconnect any other Leg					X		X			
T_Disconnect Leg 2	X	X	X	X		X		X	X	X
T_Abandon					X		X			
Call_Accepted								X		
T_Change_Of_Position (note 1)									X	
T_Service_Change (note 1)										X

Note 1 If the Automatic Rearm IE was present in the Request Report BCSM Event information flow for the T_Change_Of_Position DP, [T_Service_Change DP](#) or the T_Mid_Call DP and armed as EDP-N, then the DP shall be automatically rearmed by the gsmSSF when it is encountered.

-- Next modified section --

4.5.2 Handling of mobile originated calls

4.5.2.1 Handling of mobile originated calls in the originating MSC

The functional behaviour of the originating VMSC is specified in 3GPP TS 23.018 [**Error! Reference source not found.**]. The procedures specific to CAMEL are specified in this subclause:

- Procedure CAMEL_OCH_MSC_INIT;
- Procedure CAMEL_MO_Dialled_Services;
- Procedure CAMEL_OCH_MSC_ALERTING;
- Procedure CAMEL_OCH_MSC_ANSWER;
- Procedure CAMEL_OCH_MSC1;
- Procedure CAMEL_OCH_MSC2;
- Procedure CAMEL_OCH_MSC_DISC1;
- Procedure CAMEL_OCH_MSC_DISC2;
- Procedure CAMEL_OCH_MSC_DISC3;
- Procedure CAMEL_OCH_MSC_DISC4;
- Procedure CAMEL_Disconnect_CTR_SRF;
- Procedure CAMEL_OCH_ETC;
- Procedure CAMEL_OCH_CTR;
- Procedure CAMEL_Start_TNRy;
- Procedure CAMEL_Stop_TNRy;
- Procedure CAMEL_Store_Destination_Address;
- Procedure CAMEL_Modify_CUG_Info;
- Procedure CAMEL_N_CSI_CHECK_MSC;
- Procedure CAMEL_OCH_LEG1_MSC;
- Procedure CHECK_DIGIT_STRING_MSC;
- Process CAMEL_OCH_LEG2_MSC;
- Process CAMEL_OCH_RECONNECT_MSC;
- Procedure CAMEL_EXPORT_LEG_MSC;
- Process CAMEL_O_CHANGE_OF_POSITION_MSC;-
- [Procedure CAMEL_O_SCUDIF_MSC.](#)

NOTE: Procedure CAMEL_OCH_MSC_DISC3 applies to CAMEL Phase 1 only.

The procedure Send_Access_Connect_If_Required is specified in 3GPP TS 23.018 [**Error! Reference source not found.**].

The procedure CAMEL_OCH_LEG1_MSC supervises the originating party only. The process CAMEL_OCH_LEG2_MSC supervises the terminating party only. Hence, signals from the BSS are received by the

procedure CAMEL_OCH_LEG1_MSC and signals from the destination exchange are received by the process CAMEL_OCH_LEG2_MSC.

The following paragraphs give details on the behaviour of the MSC in the procedures CAMEL_OCH_MSC_INIT, CAMEL_OCH_ETC, CAMEL_OCH_ANSWER and CAMEL_Store_Destination_Address.

Procedure CAMEL_OCH_LEG1_MSC

6bis(13)

/* A procedure in the MSC to handle leg 1 in a CPH configuration. */

/* Signals to/from the left are to/from the BSS
Signals to/from the right are to/from the Process Subs_FSM (See 3GPP TS 23.018). */

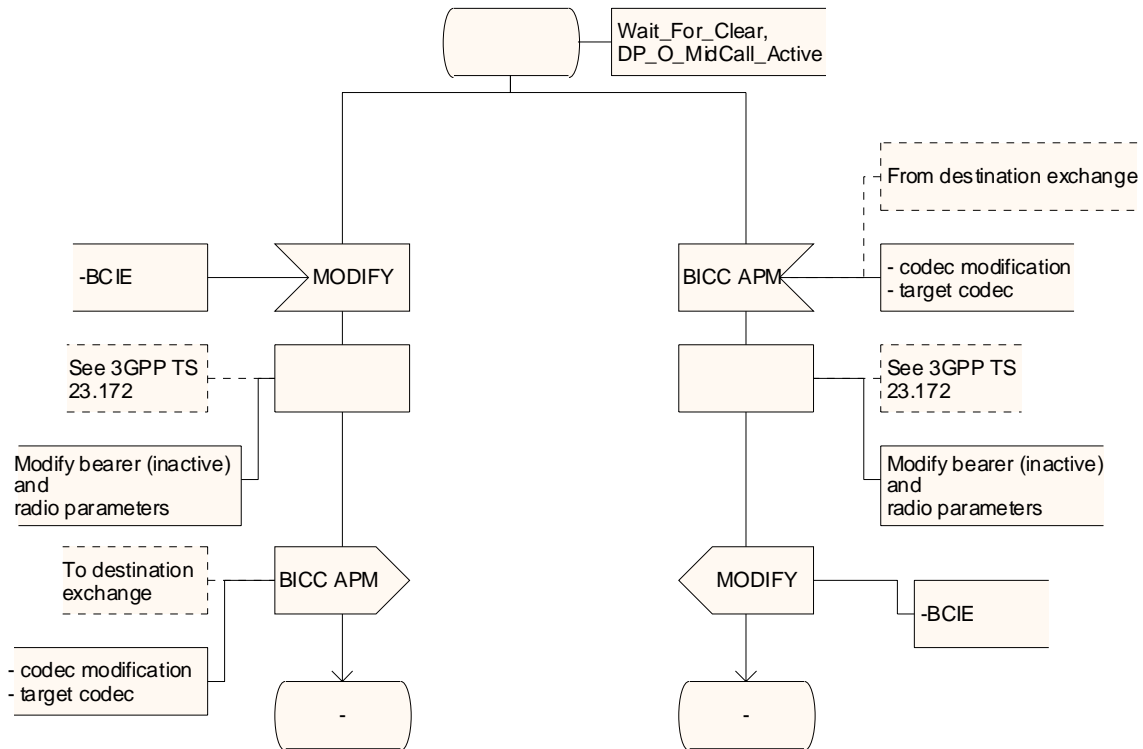


Figure 4.30-6bis: Procedure CAMEL_OCH_LEG1_MSC (sheet 6bis)

Procedure CAMEL_OCH_LEG1_MSC

6bis2(13)

/* A procedure in the MSC to handle leg 1 in a CPH configuration. */

/* Signals to/from the left are to/from the BSS
 Signals to/from the right are to/from the Process Subs_FSM (See 3GPP TS 23.018). */

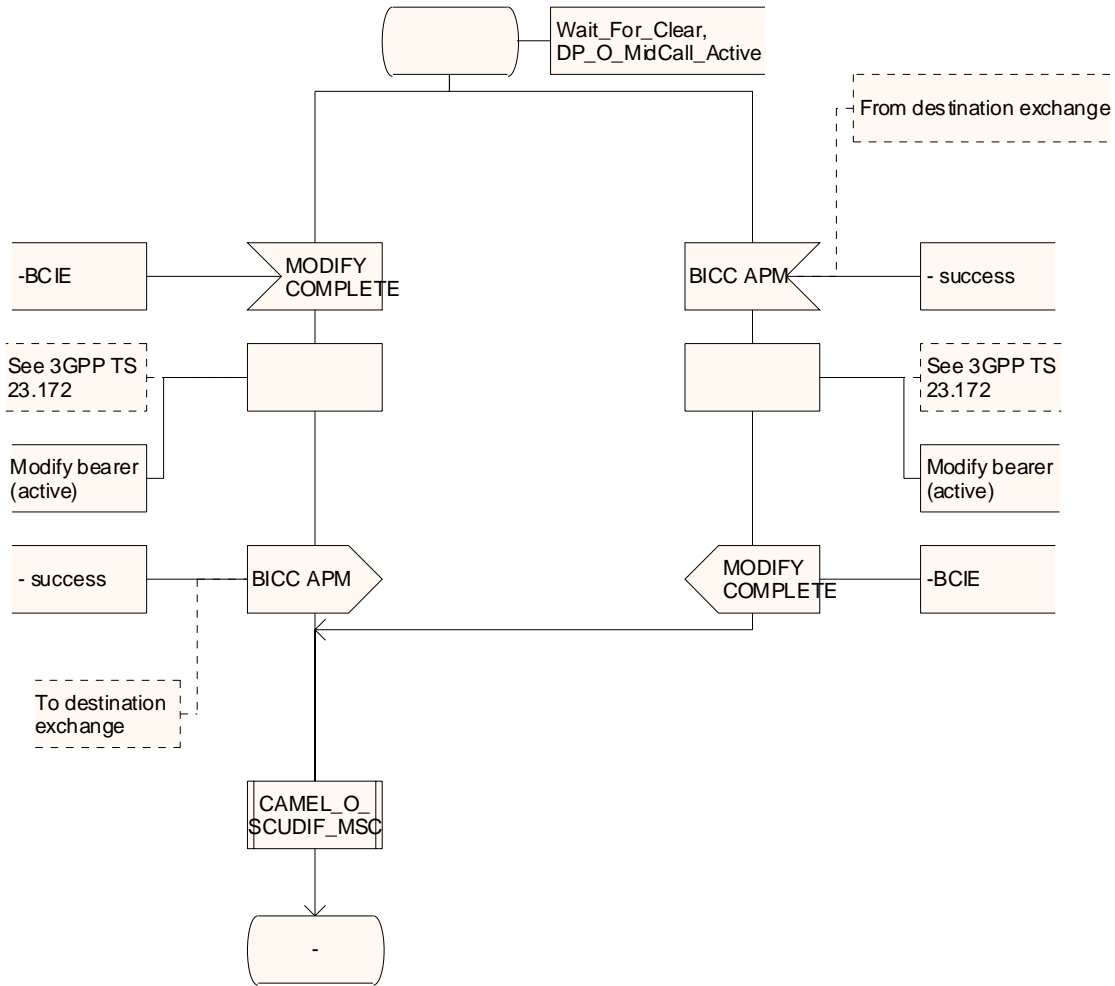


Figure 4.30-6bis2: Procedure CAMEL_OCH_LEG1_MSC (sheet 6bis2)

Procedure CAMEL_O_SCUDIF_MSC

1(1)

/ Procedure in the MSC to inform the gsmSSF that the bearer service of the call has changed */*

/ Signals to/from the left are to/from the BSS; signals to/from the right are to/from the gsmSSF if not otherwise stated. */*

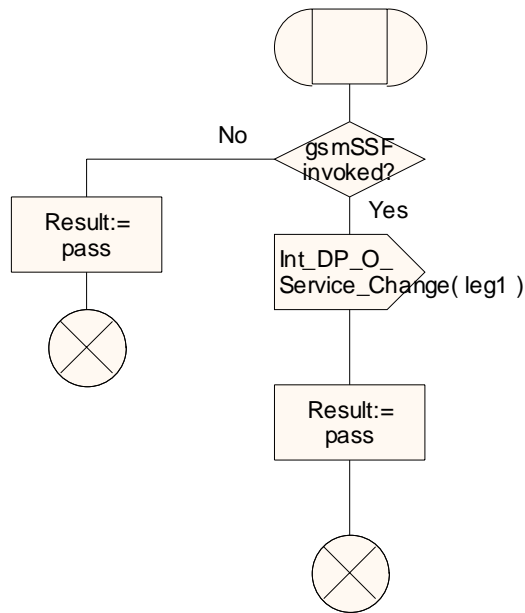


Figure 4.38-1: Procedure CAMEL_O_SCUDIF_MSC (sheet 1)

-- Next modified section --

4.5.3 Retrieval of routing information

4.5.3.1 Retrieval of routing information in the GMSC

The functional behaviour of the GMSC is specified in 3GPP TS 23.018 [12]. The procedures specific to CAMEL are specified in this subclause:

- Procedure CAMEL_Set_ORA_Parameters;
- Procedure CAMEL_MT_GMSC_INIT;
- Procedure CAMEL_MT_MSC_ALERTING;
- Procedure CAMEL_MT_GMSC_ANSWER;
- Procedure CAMEL_MT_GMSC_DISC1;
- Procedure CAMEL_MT_GMSC_DISC2;
- Procedure CAMEL_MT_GMSC_DISC3;
- Procedure CAMEL_MT_GMSC_DISC4;
- Procedure CAMEL_MT_GMSC_DISC5;
- Procedure CAMEL_MT_GMSC_DISC6;
- Procedure CAMEL_MT_CTR;
- Procedure CAMEL_MT_ETC;
- Procedure CAMEL_Start_TNRy;
- Procedure CAMEL_Stop_TNRy;
- Procedure CAMEL_MT_GMSC_Notify_CF;
- Procedure CAMEL_MT_LEG2_GMSC;
- Process CAMEL_MT_LEG1_GMSC;
- ~~Procedure CAMEL_MT_RECONNECT_GMSC;~~
- [Procedure CAMEL T SCUDIF MSC.](#)

NOTE: Procedure CAMEL_MT_GMSC_DISC3 applies to CAMEL Phase 1 only.

The procedure Send_ACM_If_Required is specified in 3GPP TS 23.018 [12].

The procedure CAMEL_MT_LEG2_GMSC supervises the terminating party only. The process CAMEL_MT_LEG1_GMSC supervises the originating party only. Hence, signals from the destination exchange are received by the procedure CAMEL_MT_LEG2_GMSC and signals from the originating exchange are received by the process CAMEL_MT_LEG1_GMSC.

The following paragraphs give details on the behaviour of the GMSC in the procedure CAMEL_MT_GMSC_INIT.

Procedure CAMEL_MT_LEG2_GMSC

bis2(3)

/ A procedure in the GMSC to handle leg 2 of an active call. */*

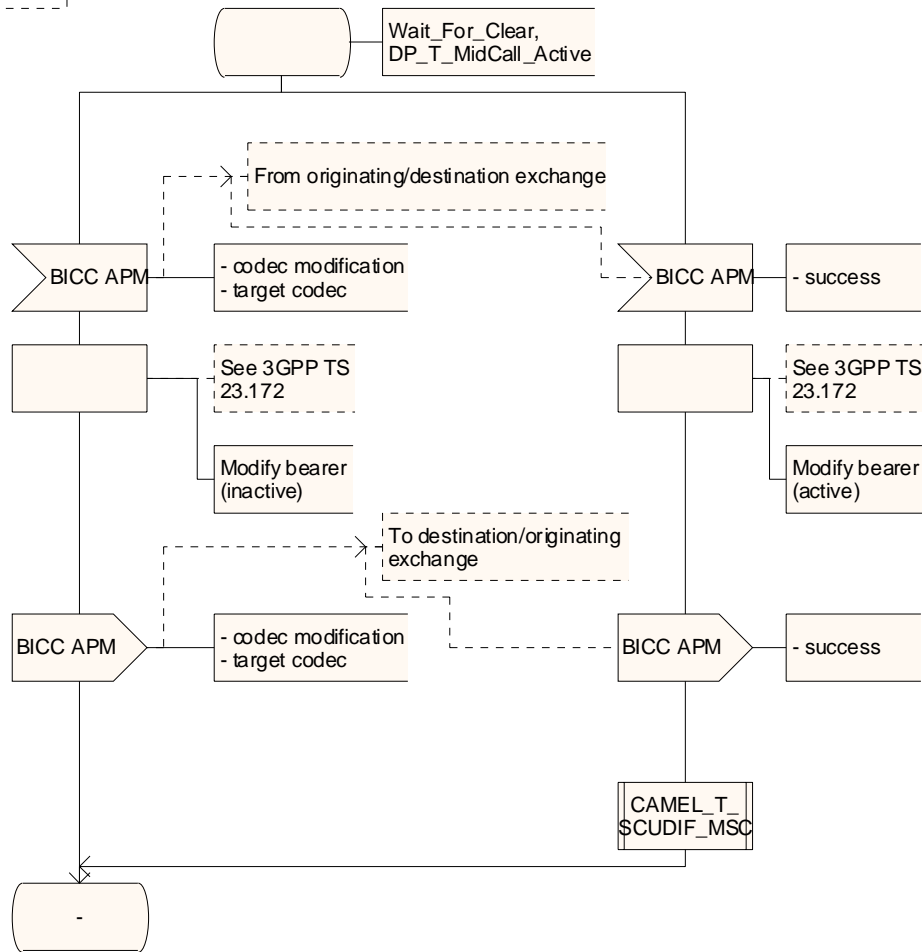


Figure 4.52-bis2: Procedure CAMEL_MT_LEG2_GMSC (sheet bis2)

Procedure CAMEL_T_SCUDIF_MSC

1(1)

/ Procedure in the MSC to inform the gsmSSF that the bearer service of the call has changed */*

/ Signals to/from the left are to/from the BSS; signals to/from the right are to/from the gsmSSF if not otherwise stated. */*

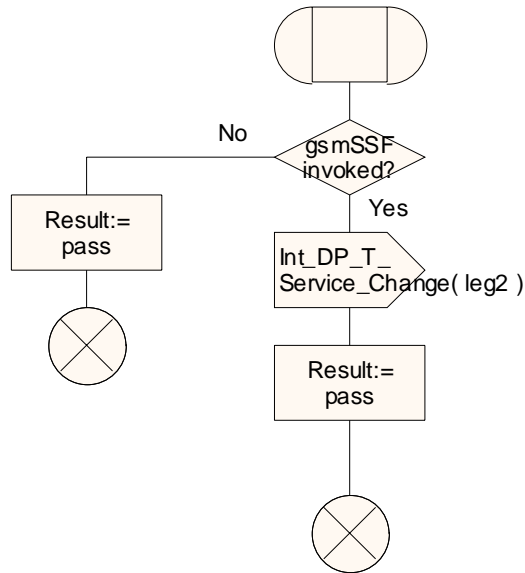


Figure 4.xx-1: Process CAMEL_T_SCUDIF_MSC (sheet 1)

-- Next modified section --

4.5.4 Handling of mobile terminating calls

4.5.4.1 Handling of mobile terminating calls in the terminating VMSC

The functional behaviour of the terminating VMSC is specified in 3GPP TS 23.018 [**Error! Reference source not found.**].

The behaviour specific to CAMEL is:

- the inclusion of the O-CSI and/or D-CSI parameter in the Perform Call Forwarding information flow sent to the process MT_CF_MSC if O-CSI and/or D-CSI was received in the Send Info For Incoming Call ack information flow;
- the requirement to suppress the connection of announcements or tones if the VLR includes the suppression of announcements parameter in the Send Info For Incoming Call negative response information flow.

The processes and procedures specific to CAMEL are specified in this subclause:

- Procedure CAMEL_ICH_VLR;
- Procedure CAMEL_O_CSI_Check_VLR;
- Procedure CAMEL_D_CSI_Check_VLR;
- Procedure CAMEL_VT_CSI_Check_VLR;
- Procedure CAMEL_ICH_MSC_INIT;
- Procedure CAMEL_MT_VMSC_Notify_CF;
- Procedure CAMEL_ICH_LEG2_MSC;
- Procedure CAMEL_ICH_LEG2_CF_MSC;
- Process CAMEL_ICH_LEG1_MSC;
- Procedure CAMEL_ICH_RECONNECT_MSC;
- Process CAMEL_T_CHANGE_OF_POSITION_MSC.

The procedure CAMEL_ICH_LEG2_MSC supervises the terminating party only. The procedure CAMEL_ICH_LEG2_CF_MSC supervises the forwarded-to party only. The process CAMEL_ICH_LEG1_MSC supervises the originating party only. Hence, signals from the BSS are received by the procedure CAMEL_ICH_LEG2_MSC, signals from the destination exchange are received by the procedure CAMEL_ICH_LEG2_CF_MSC and signals from the originating exchange are received by the process CAMEL_ICH_LEG1_MSC.

Procedure CAMEL_Ich_Leg2_MSC

3bis(9)

/* A procedure in the MSC to handle leg 2 of an active call. */

/* Signals to/from the left are to/from the Subs_FSM (See 3GPP TS 23.018); Signals to/from the right are to/from the BSS; unless otherwise stated. */

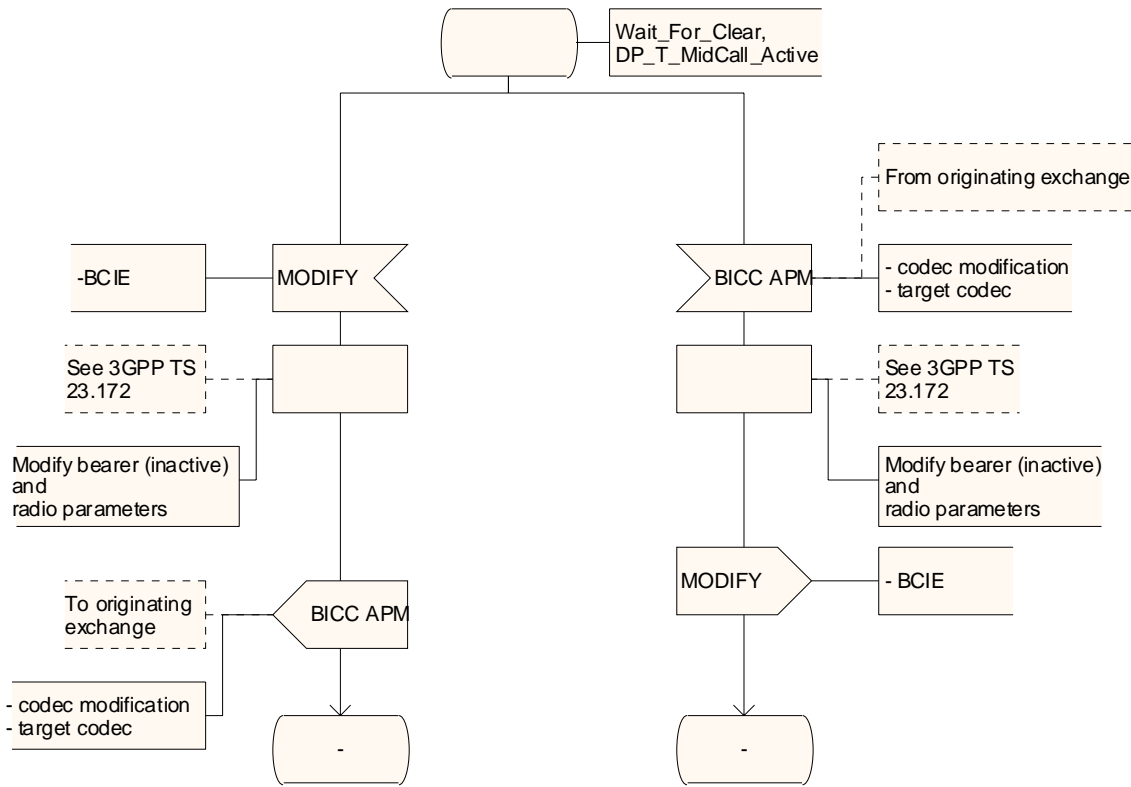


Figure 4.69-3bis: Procedure CAMEL_Ich_Leg2_MSC (sheet 3bis)

Procedure CAMEL_ICH_LEG2_MSC

3bis2(9)

/* A procedure in the MSC to handle leg 2 of an active call. */

/* Signals to/from the left are to/from the Subs_FSM (See 3GPP TS 23.018); Signals to/from the right are to/from the BSS; unless otherwise stated. */

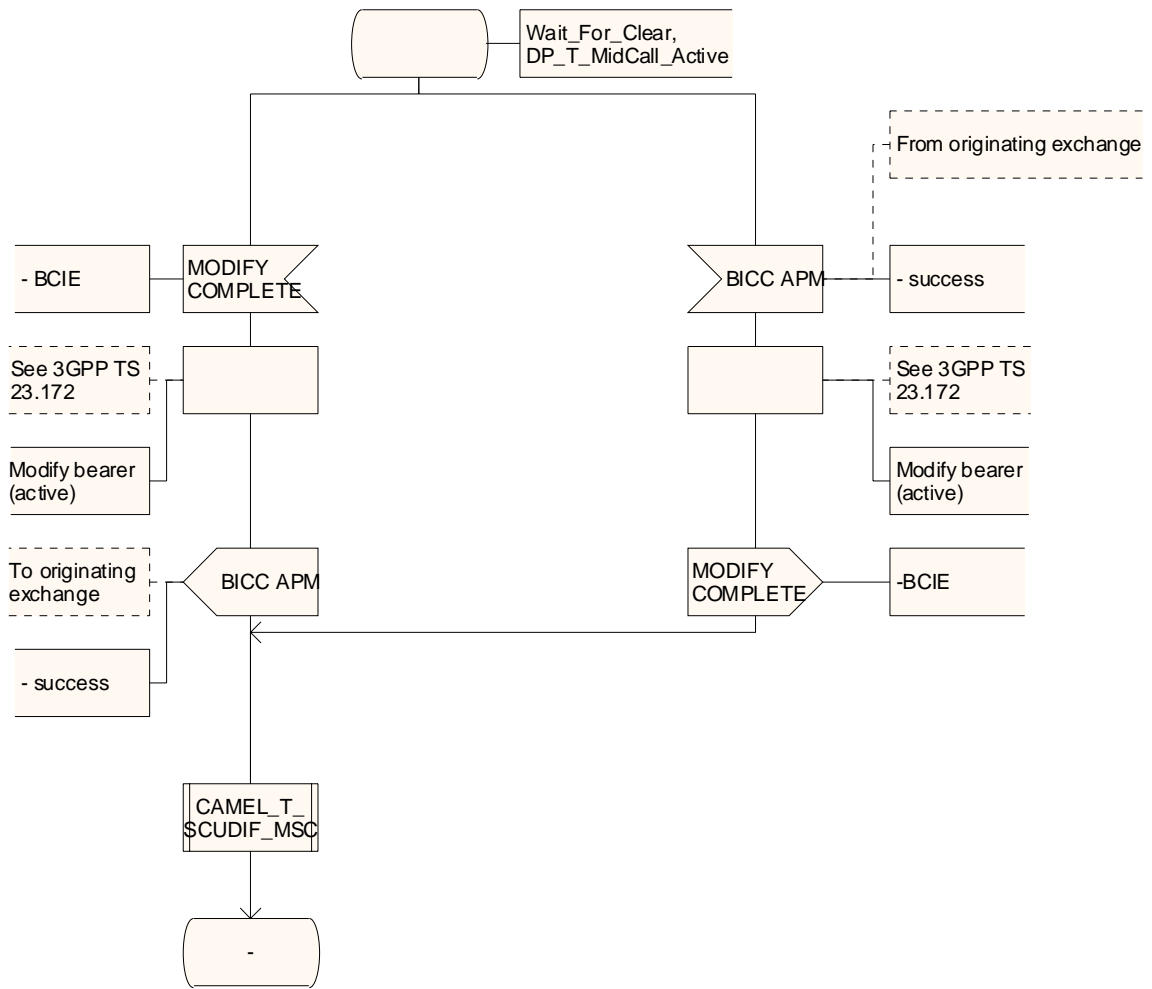


Figure 4.69-3bis2: Procedure CAMEL_ICH_LEG2_MSC (sheet 3bis2)

Procedure CAMEL_ICH_LEG2_CF_MSC

New2bis(3)

/* A procedure in the MSC to handle a forwarded leg 2 of an active call. */

/* Signals to/from the left are to/from the gsmSSF; Signals to/from the right are to/from MT_CF_MSC; unless otherwise stated. */

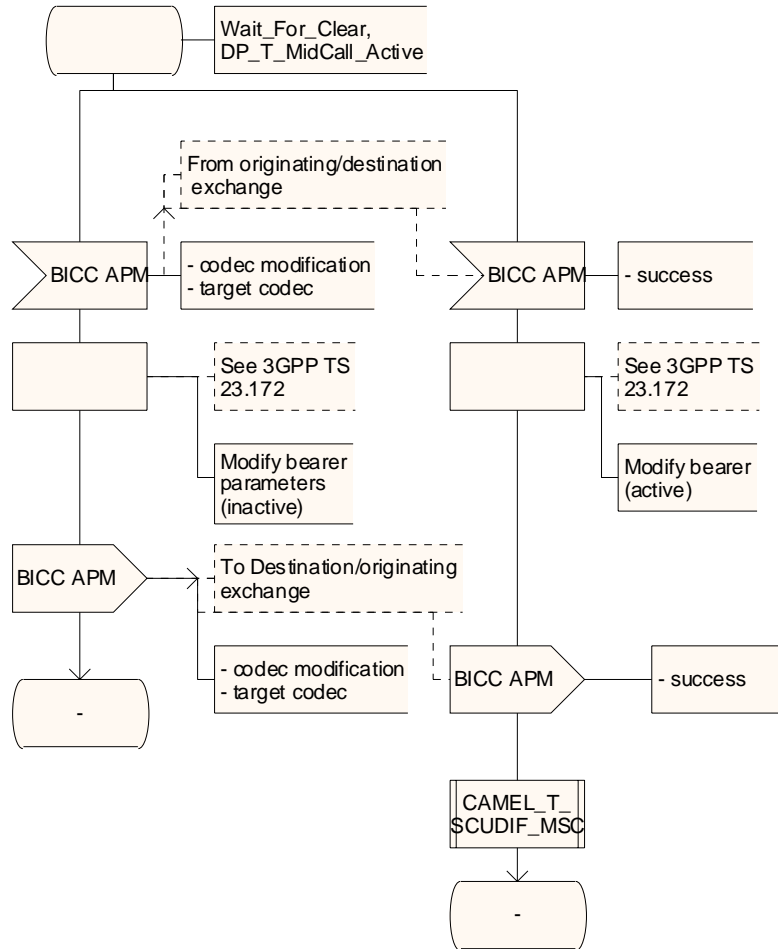


Figure 4.70-2bis: Process CAMEL_ICH_LEG2_CF_MSC (sheet 2bis)

-- Next modified section --

4.5.5 Handling of forwarded calls

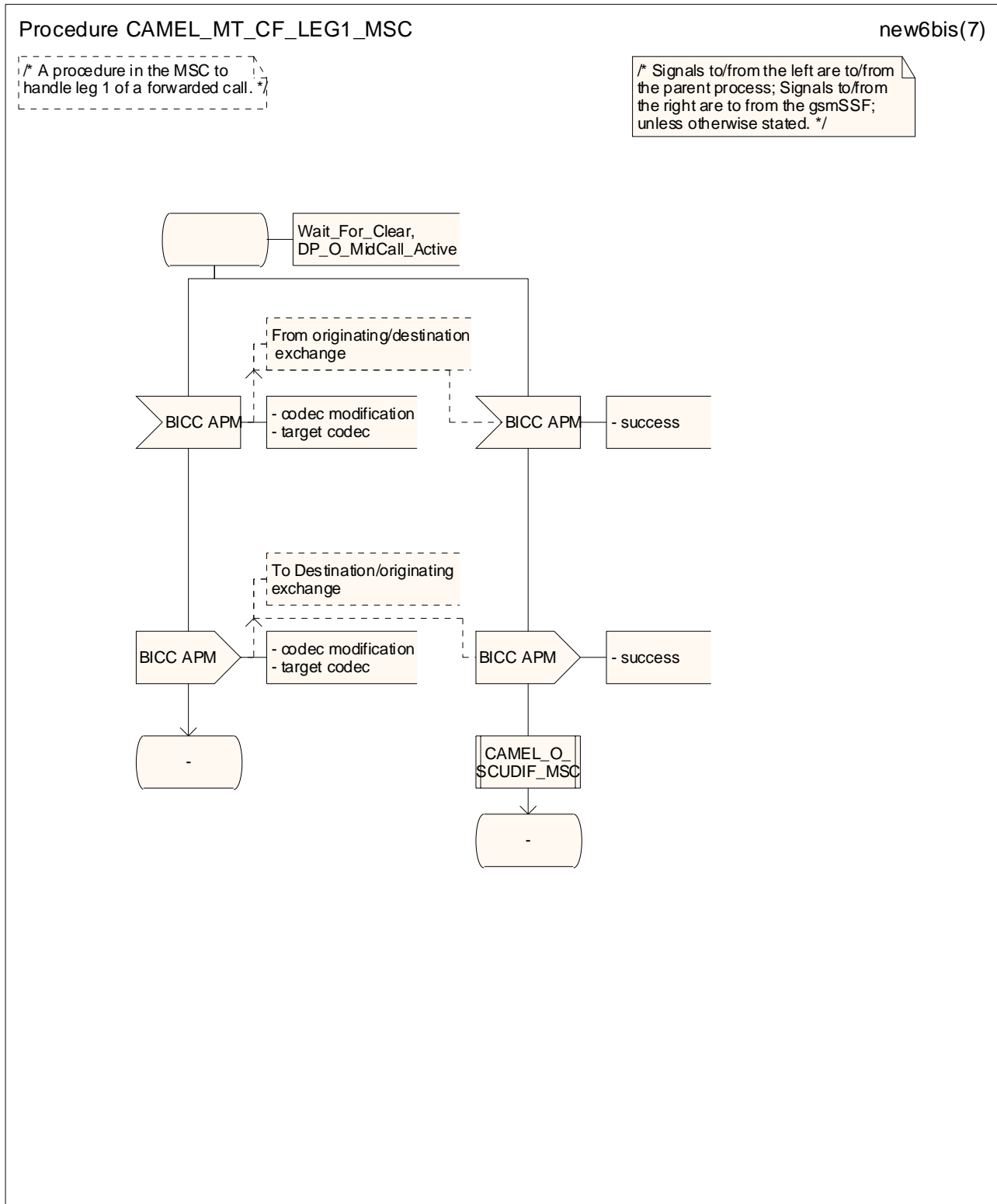


Figure 4.84-6: Procedure CAMEL_MT_CF_LEG1_MSC (sheet 6)

-- Next modified section --

4.5.6 Handling of gsmSCF initiated calls

4.5.6.1 Handling of gsmSCF initiated calls in the MSC

[<no change>](#)

-- Next modified section --

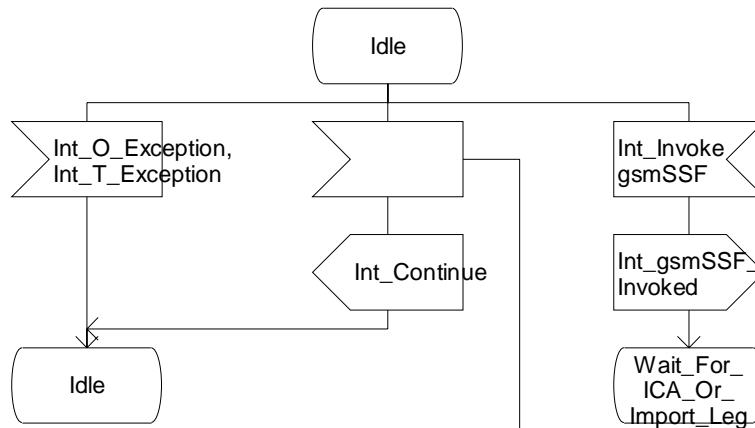
4.5.7.5 Process CS_gsmSSF and procedures

Process CS_gsmSSF

4(60)

/* Invocation of CS_gsmSSF */

/* Signals to/from the left are to/from the MSC; signals to/from the right are to/from the process CSA_gsmSSF unless otherwise marked. */



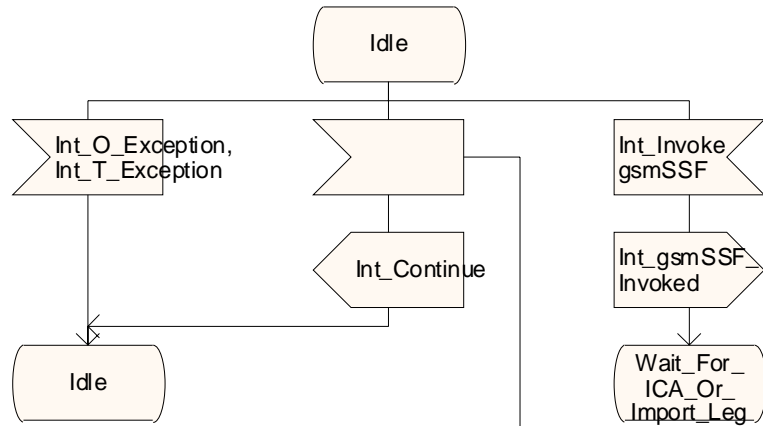
- Int_DP_O_Answer,
- Int_DP_T_Answer,
- Int_DP_Analysed_Info,
- Int_DP_O_Term_Seized,
- Int_DP_Call_Accepted,
- Int_DP_O_MidCall,
- Int_DP_T_MidCall,
- Int_DP_O_Change_Of_Position,
- Int_DP_T_Change_Of_Position

Process CS_gsmSSF

4(61)

/ Invocation of CS_gsmSSF */*

/ Signals to/from the left are to/from the MSC; signals to/from the right are to/from the process CSA_gsmSSF unless otherwise marked. */*



Int_DP_O_Answer,
Int_DP_T_Answer,
Int_DP_Analysed_Info,
Int_DP_O_Term_Seized,
Int_DP_Cal_Accepted,
Int_DP_O_MidCall,
Int_DP_T_MidCall,
Int_DP_O_Change_Of_Position,
Int_DP_T_Change_Of_Position,
Int_DP_O_Bearer_Change,
Int_DP_T_Bearer_Change

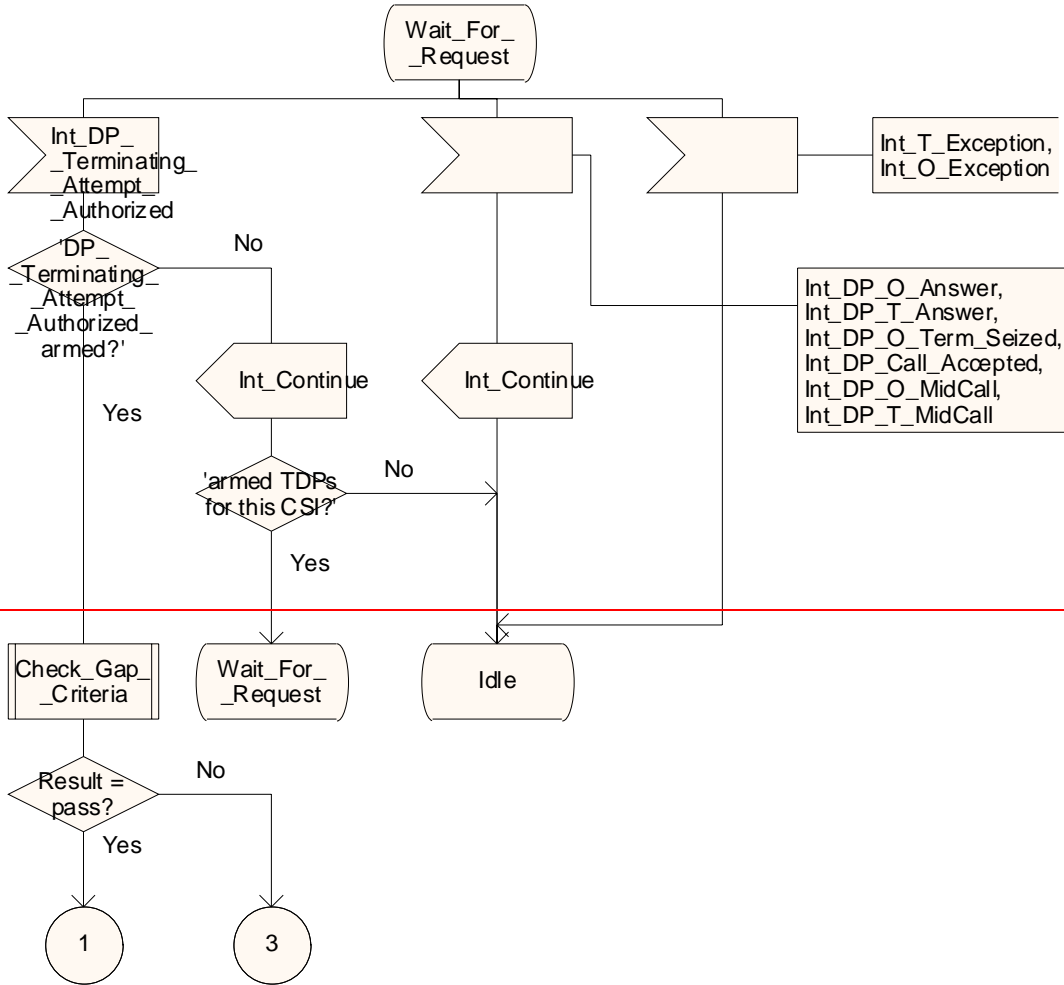
Figure 4.97-4: Process CS_gsmSSF (sheet 4)

Process CS_gsmSSF

6(60)

/* Invocation of CS_gsmSSF */

/* Signals to/from the left are to/from the MSC; signals to/from the right are to/from the process CSA_gsmSSF unless otherwise marked. */

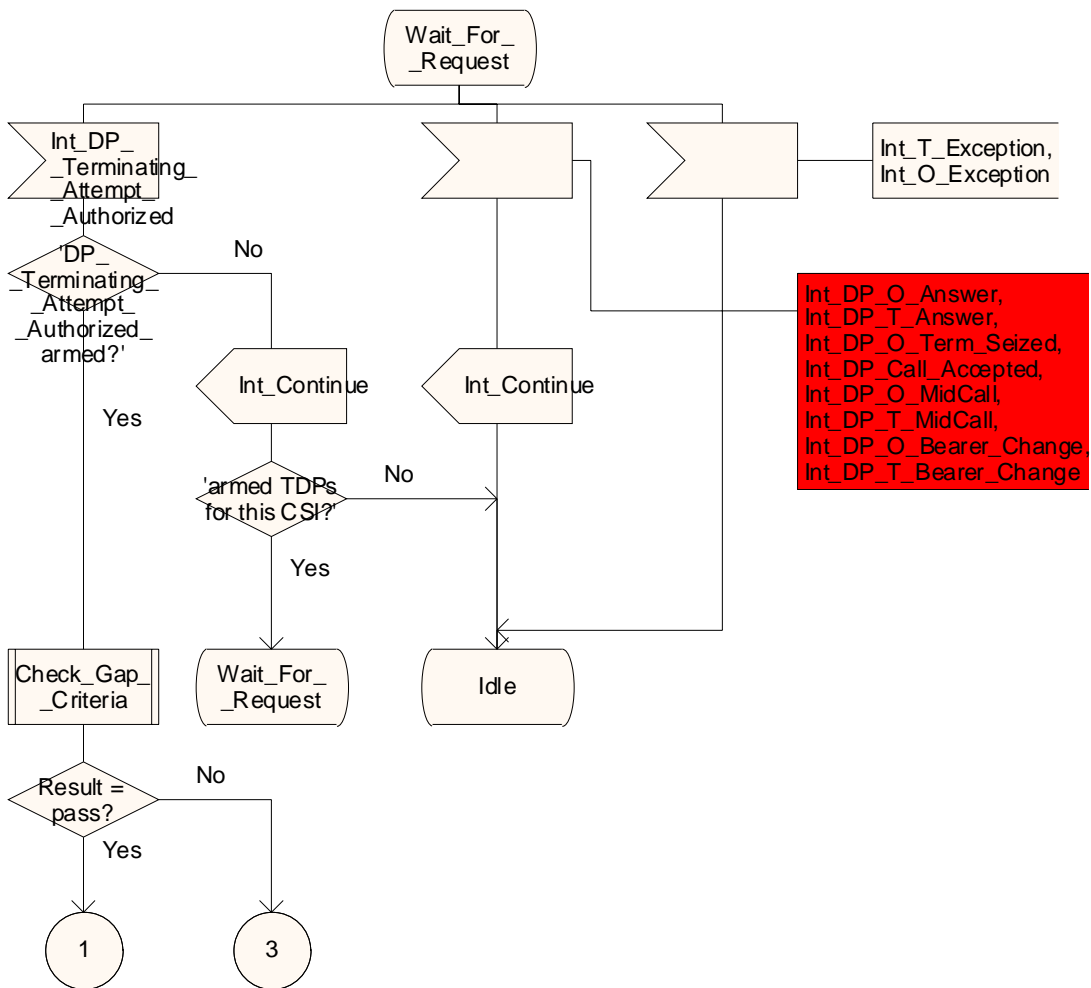


Process CS_gsmSSF

6(60)

/ Invocation of CS_gsmSSF */*

/ Signals to/from the left are to/from the MSC; signals to/from the right are to/from the process CSA_gsmSSF unless otherwise marked. */*



Int_DP_O_Answer,
Int_DP_T_Answer,
Int_DP_O_Term_Seized,
Int_DP_Call_Accepted,
Int_DP_O_MidCall,
Int_DP_T_MidCall,
Int_DP_O_Bearer_Change,
Int_DP_T_Bearer_Change

Figure 4.97-6: Process CS_gsmSSF (sheet 6)

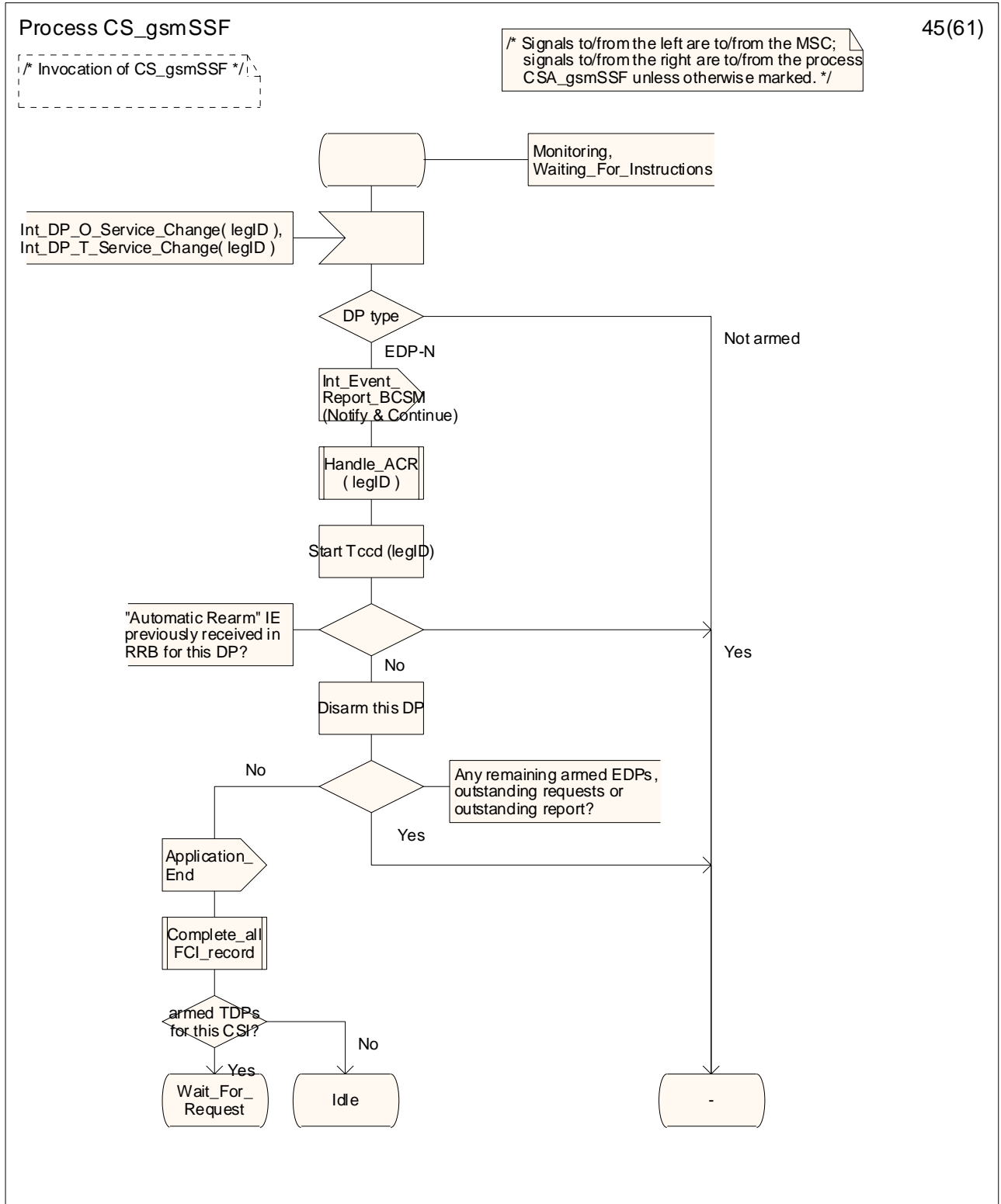


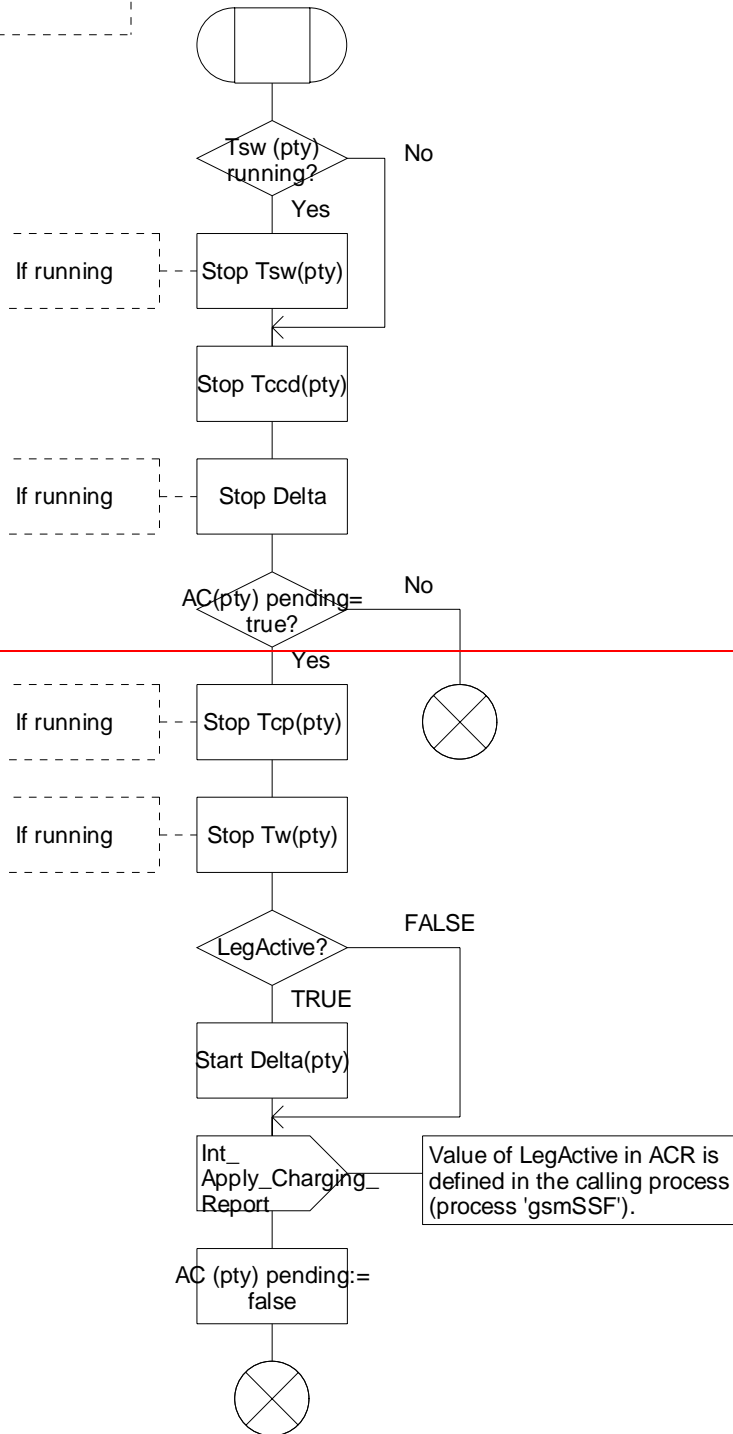
Figure 4.97-44x: Process CS_gsmSSF (sheet 44x)

Procedure Handle_ACR

1(1)

/*This procedure is only called at the end of connection to an outgoing leg, a temporary connection or a connection to a SRF when the call can be continued*/
 FPAR IN pty LegID_or_srfID

/* Signals to/from the right are to/from the Process CSA_gsmSCF. */



Procedure Handle_ACR

1(1)

*/*This procedure is called by the CS_gsmSSF*/
 FPAR IN pty LegID_or_srflD*

/ Signals to/from the right are to/from
 the Process CSA_gsmSSF. */*

CR editor's note:
 The box above is changed.

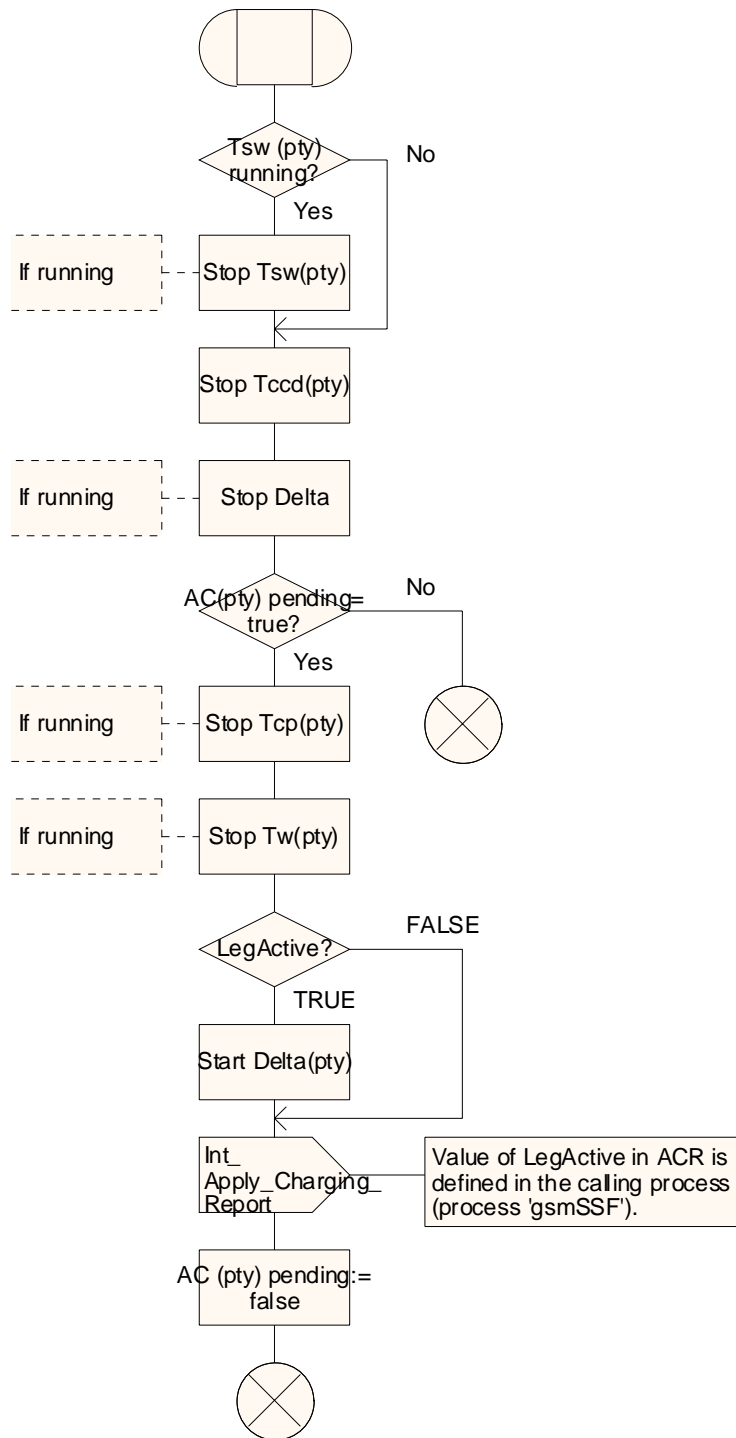


Figure 4.102-1: Procedure Handle_ACR (sheet 1)

-- Next modified section --

4.6 Description of information flows

4.6.1 gsmSSF to gsmSCF information flows

...

4.6.1.6 Event Report BCSM

4.6.1.6.1 Description

This IF is used to notify the gsmSCF of a call-related event (i.e. BCSM events as answer and disconnect) previously requested by the gsmSCF in a Request Report BCSM Event IF.

4.6.1.6.2 Information Elements

Information element name	MO	MF	MT	VT	NC	NP	Description
Event Type BCSM	M	M	M	M	M	M	This IE specifies the type of event that is reported.
Event Specific Information BCSM	C	C	C	C	C	C	This IE indicates the call related information specific to the event.
Leg ID	M	M	M	M	M	M	This IE indicates the party in the call for which the event is reported.
Misc Call Info	M	M	M	M	M	M	This IE indicates the DP type.

If the Event Type BCSM IE contains either O_Answer or T_Answer, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Destination Address	M	M	M	M	M	M	This IE specifies the destination address for the call leg. The <i>NatureOfAddress indicator</i> may contain a national-specific value. For some national-specific <i>NatureOfAddress indicator</i> values the length of the digit part of destination address may be zero.
OR	-	C	C	-	-	-	This IE indicates that the call was subject to basic Optimal Routing as specified in 3GPP TS 23.079 [19].
Forwarded Call	-	M	C	C	-	-	This IE indicates that the call has been subject to a Call Forwarding supplementary service.
Charge Indicator	S	S	S	S	S	S	This IE specifies the value which will be stored in the Call Data Record. See ITU-T Recommendation Q.763 [43].
Ext-Basic Service Code	S	S	S	S	-	-	This IE is used for SCUDIF calls. It indicates the type of basic service, i.e. teleservice or bearer service. It indicates the service active at answer for the SCUDIF call (as defined in 3GPP TS 23.172 [27]).
Ext-Basic Service Code 2	S	S	S	S	-	-	This IE is used for SCUDIF calls. It indicates the type of basic service, i.e. teleservice or bearer service. It indicates the service which is not active at answer for the SCUDIF call (as defined in 3GPP TS 23.172 [27]). It shall be present if the negotiation of the SCUDIF services resulted in both basic services for the SCUDIF call. Otherwise shall be absent.

If the Event Type BCSM IE contains either O_Mid_Call or T_Mid_Call, then the Event Specific Information BCSM IE contains the following information element:

Information element name	MO	MF	MT	VT	NC	NP	Description
Midcall Info	M	-	-	M	-	-	This IE is described in a table below.

MidCall Info contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
DTMF Digits Completed	S,E	-	-	S,E	-	-	This IE contains the detected mid-call digits. This IE shall be present when triggering takes place after the minimum number of digits has been detected.
DTMF Digits Timeout	S,E	-	-	S,E	-	-	This IE contains the detected mid-call digits. This IE shall be present when triggering takes place before the minimum number of digits has been detected.

If the Event Type BCSM IE contains one of Route_Select_Failure, O_Busy, O_Disconnect or T_Disconnect, then the Event Specific Information BCSM IE contains the following information element:

Information element name	MO	MF	MT	VT	NC	NP	Description
Cause	C	C	C	C	C	C	This IE indicates the cause.

If the Event Type BCSM IE contains T_Busy, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Cause	C	C	C	C	-	-	This IE indicates the cause.
Call forwarded	-	-	C	C	-	-	This IE indicates that the call may be forwarded by the appropriate Call Forwarding supplementary service or Call Deflection supplementary service. If T_Busy is reported from the GMSC, then this IE shall be present in the following cases: <ul style="list-style-type: none"> - The event is triggered by the reception of an FTN in the 2nd Send Routeing Info ack from the HLR; - The event is triggered by the reception of the Resume Call Handling information flow from the VMSC. If T_Busy is reported from the VMSC, then this IE shall be present in the following cases: <ul style="list-style-type: none"> - The event is triggered by the invocation of conditional call forwarding (Busy or Not_Reachable); - The event notification is triggered by the invocation of Call Deflection.
Route Not permitted	-	-	S	-	-	-	This IE indicates that the further call setup will not take place in this GMSC due to the rules of basic optimal routeing. See 3GPP TS 23.079 [19].
Forwarding Destination Number	-	-	C	C	-	-	This IE contains the Forwarded-to-Number or the Deflected-to-Number. It shall be present if the Call Forwarded IE is present. Otherwise, it shall be absent.

If the Event Type BCSM IE contains T_No_Answer, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Call Forwarded	-	-	C	C	-	-	This IE indicates that the call may be forwarded by the appropriate Call Forwarding supplementary service. If T_No_Answer is reported from the GMSC, then this IE shall be present in the following cases: - The event is triggered by the reception of the Resume Call Handling information flow from the VMSC. If the T_No_Answer is reported from the VMSC, then this IE shall be present in the following cases: - The event is triggered by the invocation of conditional call forwarding (No_Answer).
Forwarding Destination Number	-	-	C	C	-	-	This IE contains the Forwarded-to-Number or the Deflected-to-Number. It shall be present if the Call Forwarded IE is present. Otherwise, it shall be absent.

If the Event Type BCSM IE contains Call_Accepted, O_Term_Seized, O_Change_Of_Position or T_Change_Of_Position, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Location Information	C	-	-	C	-	-	See subclause 4.6.1.8 with VLR Number IE as "- (not applicable)".

If the Event Type BCSM IE contains O_Abandon, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Route Not Permitted	-	S	-	-	-	-	This IE indicates that the further call setup will not take place in this MSC due to the rules of basic optimal routing. See 3GPP TS 23.079 [19].

If the Event Type BCSM IE contains one of O_Service_Change or T_Service_Change, then the Event Specific Information BCSM IE contains the following information elements:

<u>Information element name</u>	<u>MO</u>	<u>MF</u>	<u>MT</u>	<u>VT</u>	<u>NC</u>	<u>NP</u>	<u>Description</u>
<u>Ext-Basic Service Code</u>	<u>M</u>	<u>M</u>	<u>M</u>	<u>M</u>	<u>-</u>	<u>-</u>	<u>This IE indicates the new basic service code after a successful bearer service modification.</u>

If the Event Type BCSM IE contains O_No_Answer, then the Event Specific Information BCSM IE is not included.

-- Next modified section --

4.6.1.8 Initial DP

4.6.1.8.1 Description

This IF is generated by the gsmSSF when a trigger is detected at a DP in the BCSM, to request instructions from the gsmSCF.

4.6.1.8.2 Information Elements

(Note: IEs in the NC columns in this IF may need further study.)

Information element name	MO	MF	MT	VT	NC	NP	Description
Additional Calling Party Number	C	C	C	C	-	C	This IE contains the calling party number provided by the access signalling system of the calling user or received from the gsmSCF due to the previous CAMEL processing.
Bearer Capability	M	C	C	C	-	C	This IE indicates the type of the bearer capability connection to the user. If Bearer Capability 2 is present, then it indicates the preferred bearer capability for a SCUDIF (as defined in 3GPP TS 23.172 [27]) call.
Called Party Number	C	M	M	M	-	M	This IE contains the number used to identify the called party in the forward direction. For MO and MF calls this IE is used in the case of TDP Route_Select_Failure (this is the destination number used to route the call) and in the case of TDP Busy and TDP No Reply (this is the MSISDN when the destination number used for the call is an MSRN, or in the case of unsuccessful call establishment received from the HLR via the MAP interface, otherwise it is the number used to route the call). For VT calls when there is no forwarding pending this is the MSISDN received in the Provide Roaming Number; if the MSISDN is not available, the basic MSISDN is used. For the MT and VT call case when there is call forwarding or call deflection pending, this is the MSISDN, i.e. not the forwarded-to or deflected-to number. If the Initial DP IF is sent at TDP Route_Select_Failure or TDP Analysed_Information then the <i>NatureOfAddress indicator</i> may contain a national-specific value. For some national-specific <i>NatureOfAddress indicator</i> values the length of the digit part of the destination address may be zero.

Information element name	MO	MF	MT	VT	NC	NP	Description
Called Party BCD Number	C	-	-	-	-	-	This IE contains the number used to identify the called party in the forward direction. It is used for an MO call in all cases except in the case of TDP Route_Select_Failure. For the TDP Collected_Information, the number contained in this IE shall be identical to the number received over the access network. It may e.g. include service selection information, such as * and # digits, or carrier selection information dialled by the subscriber. For the TDP Analysed_Information, the number contained in this IE shall be the dialled number received over the network access or received from a gsmSCF in a Connect IF, Service selection information, such as * and # digits may be present (see subclause 4.2.1.2.2); carrier selection information dialled by the subscriber is not present.
Calling Party Number	M	C	C	C	-	C	This IE carries the calling party number to identify the calling party or the origin of the call.
Calling Partys Category	M	C	C	C	-	C	This IE indicates the type of calling party (e.g., operator, pay phone, ordinary subscriber).
CallGap Encountered	C	C	C	C	-	C	This IE indicates the type of gapping which has been applied to the related call. This IE shall be present only if a call gapping context is applicable to the Initial DP IF.
Call Reference Number	M	M	M	M	-	M	This IE may be used by the gsmSCF for inclusion in a network optional gsmSCF call record. It has to be coupled with the identity of the MSC which allocated it in order to define unambiguously the identity of the call. For MO calls, the call reference number is set by the serving VMSC and included in the MO call record. For MT calls, the call reference number is set by the GMSC and included in the RCF call record in the GMSC and in the MT call record in the terminating MSC. For VT calls, the call reference number is set by the GMSC and included in the RCF call record in the GMSC and in the MT call record in the terminating MSC. For CF calls, the call reference number is set by the GMSC and included in the CF record in the forwarding MSC.
Cause	C	C	C	C	-	-	This IE indicates the cause specific to the armed BCSM DP event. This IE is applicable to DP Route_Select_Failure and DP T_Busy. The cause may be used by the gsmSCF to decide how to continue the call handling.
Event Type BCSM	M	M	M	M	-	M	This IE indicates the armed BCSM DP event, resulting in the Initial DP IF.
Ext-Basic Service Code	C	C	C	C	-	C	This IE indicates the type of basic service, i.e. teleservice or bearer service. If Bearer Capability 2 is present, then it indicates the basic service which corresponds to the preferred bearer capability for a SCUDIF (as defined in 3GPP TS 23.172 [27]) call.
High Layer Compatibility	C	C	C	C	-	C	This IE indicates the type of the high layer compatibility, which will be used to determine the ISDN-teleservice of a connected ISDN terminal.

Information element name	MO	MF	MT	VT	NC	NP	Description
IMSI	M	M	M	M	-	S	This IE identifies the mobile subscriber. For the NP case, the IMSI is mandatory if the new party is initiated in an MO, MF, MT, or VT call, otherwise it shall be absent.
IP SSP Capabilities	C	C	C	C	-	C	This IE indicates which SRF resources are supported within the gsmSSF and are available. If this IE is absent, it indicates that no gsmSRF is attached and available.
Location Information	M	-	C	M	-	-	This IE is described in a table below.
Location Number	M	C	C	C	-	-	For mobile originated calls this IE represents the location of the calling party. For all other call scenarios this IE contains the location number received in the incoming ISUP signalling.
MSC Address	M	M	M	M	-	M	For MO calls, the MSC Address carries the international E.164 address of the serving VMSC. For MT calls, the MSC Address carries the international E.164 address of the GMSC. For VT calls, the MSC Address carries the international E.164 address of the serving VMSC. For MF calls, the MSC Address carries the international E.164 address of the forwarding MSC. For the NP case, the MSC address carries the international E.164 address of the serving VMSC (the NP case in the GMSC will not cause an Initial DP IF).
GMSC Address	-	M	-	M	-	S	For CF calls, the GMSC Address carries the international E.164 address of the GMSC. For VT calls, the GMSC Address carries the international E.164 address of the GMSC. For NP case, the GMSC Address is mandatory if the new party is initiated in an MF call or in a VT call, otherwise it shall be absent. The GMSC Address carries the international E.164 address of the GMSC.
Carrier	S	S	S	S	-	S	This IE is described in a table below. This IE may be present when the VPLMN and the HPLMN of the subscriber are both North American. For MO calls, this IE shall identify any carrier that was explicitly selected by the calling subscriber. If no carrier was explicitly selected, this IE shall contain the calling subscriber's subscribed carrier. For MT and VT calls, the IE shall contain the carrier subscribed to by the called subscriber. For MF calls, the IE shall contain the carrier subscribed to by the forwarding subscriber.
Original Called Party ID	C	C	C	C	-	-	This IE carries the dialled digits if the call has met call forwarding on the route to the gsmSSF. This IE shall also be sent if it was received from the gsmSCF due to previous CAMEL processing.
Redirecting Party ID	C	C	C	C	-	-	This IE indicates the directory number the call was redirected from. This IE shall also be sent if it was received from the gsmSCF due to previous CAMEL processing.
Redirection Information	C	C	C	C	-	-	This IE contains forwarding related information, such as the redirection counter.
Service Key	M	M	M	M	-	M	This IE indicates to the gsmSCF the requested CAMEL Service. It is used to address the required application within the gsmSCF.

Information element name	MO	MF	MT	VT	NC	NP	Description
Subscriber State	-	-	C	C	-	-	This IE indicates the status of the MS. The states are: - CAMEL Busy: The MS is engaged on a transaction for a mobile originating or terminated circuit-switched call. - Network Determined Not Reachable: The network can determine from its internal data that the MS is not reachable. - Assumed Idle: The state of the MS is neither "CAMEL Busy" nor "Network Determined Not Reachable". - Not provided from VLR.
Time And Timezone	M	M	M	M	-	M	This IE contains the time that the gsmSSF was triggered, and the time zone in which gsmSSF resides.
Call Forwarding SS Pending	-	-	C	C	-	-	If the Initial DP IF is sent from the GMSC, then this IE shall be present in the following cases: - The GMSC has received an FTN in the 1st Send Routeing Info ack IF from the HLR. - The GMSC has received an FTN in the 2nd Send Routeing Info ack IF from the HLR and no relationship with the gsmSCF exists at that moment. - The GMSC has received the Resume Call Handling IF from the VMSC and no relationship with the gsmSCF exists at that moment. If the Initial DP IF is sent from the VMSC, then this IE shall be present in the following cases: - Conditional call forwarding is invoked and no relationship with the gsmSCF exists at that moment. - Call Deflection is invoked and no relationship with the gsmSCF exists at that moment.
Forwarding Destination Number	-	-	C	C	-	-	This IE contains the Forwarded-to-Number or the Deflected-to-Number. It shall be present if the Call Forwarding SS Pending IE is present, otherwise it shall be absent.
Service Interaction Indicators Two	C	C	C	C	-	C	The IE is described in a table below. This IE is present if it is received in the ISUP message or due to previous CAMEL processing.
CUG Index	C	-	-	-	-	C	See 3GPP TS 23.085 [22] for details of this IE.
CUG Interlock Code	C	C	C	C	-	C	This IE shall be set according to 3GPP TS 23.085 [22] unless modified by the gsmSCF via the Connect or Continue With Argument IFs.
Outgoing Access Indicator	C	C	C	C	-	C	This IE shall be set according to the 3GPP TS 23.085 [22] unless modified by the gsmSCF via the Connect or Continue With Argument IFs.
MS Classmark 2	C	-	-	-	-	-	This IE contains the MS classmark 2, which is sent by the MS when it requests access to setup the MO call or responds to paging in the CS domain.
IMEI (with software version)	C	-	-	-	-	-	This IE contains the IMEISV (as defined in 3GPP TS 23.003 [7]) of the ME in use by the served subscriber.
Supported CAMEL Phases	M	M	M	M	M	M	This IE indicates the CAMEL Phases supported by the GMSC or the VMSC.

Information element name	MO	MF	MT	VT	NC	NP	Description
Offered CAMEL4 Functionalities	M	M	M	M	M	M	This IE is described in a table below. This IE indicates the CAMEL phase 4 functionalities offered by the GMSC or the VMSC.
Bearer Capability 2	C	C	C	C	-	-	This IE indicates the type of the bearer capability connection to the user. If Bearer Capability 2 is present, then it indicates the less preferred bearer capability for a SCUDIF (as defined in 3GPP TS 23.172 [27]) call.
Ext-Basic Service Code 2	C	C	C	C	-	-	This IE indicates the type of basic service, i.e. teleservice or bearer service. If bearer Capability 2 is present, then it indicates the basic service which corresponds to the less preferred bearer capability for a SCUDIF call.
Enhanced Dialed Services Allowed	S	S	-	-	S	S	This IE indicates that the gsmSCF may use the Enhanced Dialed Services (EDS). This IE shall be included if and only if all of following four conditions are fulfilled: <ul style="list-style-type: none"> - this IF is sent due to triggering on DP Analysed_Information; and - the EDS functionality is offered for this call (as indicated in the Offered CAMEL4 Functionalities); and - there is no more than one outgoing leg within this call; and - there is no other CAMEL dialogue active for the leg for which this IF is sent.

Offered CAMEL4 Functionalities contains the following information elements:

Information element name	Status	Description
Initiate Call Attempt	S	This IE indicates that the gsmSCF may send to the gsmSSF the Initiate Call Attempt IF.
Split Leg	S	This IE indicates that the gsmSCF may send to the gsmSSF the Split Leg IF.
Move Leg	S	This IE indicates that the gsmSCF may send to the gsmSSF the Move Leg IF.
Disconnect Leg	S	This IE indicates that the gsmSCF may send to the gsmSSF the Disconnect Leg IF.
Entity Released	S	This IE indicates that the gsmSSF will send to the gsmSCF the Entity Released IF, when appropriate.
DFC With Argument	S	This IE indicates that the gsmSCF may send to the gsmSSF the Disconnect Forward Connection With Argument IF.
Play Tone	S	This IE indicates that the gsmSCF may send to the gsmSSF the Play Tone IF.
DTMF Mid Call	S	This IE indicates that the gsmSCF may instruct the gsmSSF to arm the O_MidCall or T_MidCall DP. The gsmSCF may instruct the gsmSSF to automatically re-arm the DP, when encountered.
Charging Indicator	S	This IE indicates that the Charge Indicator IE may be present in the Event Report BCSM IF reporting the O_Answer or T_Answer DP.
Alerting DP	S	This IE indicates that the gsmSCF may instruct the gsmSSF to arm the O_Term_Seized or Call_Accepted DP.
Location At Alerting	S	This IE indicates that the Location Information IE shall be present (if available) in the Event Report BCSM IF reporting the O_Term_Seized or Call_Accepted DP.
Change Of Position DP	S	This IE indicates that the gsmSCF may instruct the gsmSSF to arm the O_Change_Of_Position or T_Change_Of_Position DPs. The gsmSCF may instruct the gsmSSF to automatically re-arm the DP, when encountered.
OR Interactions	S	This IE indicates that the gsmSCF may send to the gsmSSF the Basic OR Interrogation Requested IE in the Connect or Continue With Argument IF. This IE indicates that the Route Not Permitted IE may be present in the Event Report BCSM IF reporting the O_Abandon DP.
Warning Tone Enhancements	S	This IE indicates that the gsmSCF may send to the gsmSSF the Burstlist IE (within the Audible Indicator IE) in an Apply Charging IF.
CF Enhancements	S	This IE indicates that the Forwarding Destination Number IE may be present in the Event Report BCSM IF reporting the T_Busy or T_No_Answer DP.

Information element name	Status	Description
Criteria for Change Of Position DP	S	This IE indicates that the gsmSCF may send to the gsmSSF in the Request Report BCSM Event IF criteria for reporting the report of O_Change_Of_Position or T_Change_Of_Position.
Subscribed Enhanced Dialed Services	S	This IE indicates that Subscribed Enhanced Dialed Services is offered.
Serving Network Enhanced Dialed Services	S	This IE indicates that Serving Network Enhanced Dialed Services is offered.
Service Change DP	S	This IE indicates that the gsmSCF may instruct the gsmSSF to arm the O_Service_Change or T_Service_Change DPs. The gsmSCF may instruct the gsmSSF to automatically re-arm the DP, when encountered.

Location Information is defined in 3GPP TS 23.018 [12]. The following differences apply:

Information element name	MO	MF	MT	VT	NC	NP	Description
Location Number	-	-	C	C	-	-	See 3GPP TS 23.018 [12].
Service area ID	C,E	-	C,E	C,E	-	-	See 3GPP TS 23.018 [12].
Cell ID	C,E	-	C,E	C,E	-	-	See 3GPP TS 23.018 [12].
Geographical information	C	-	C	C	-	-	See 3GPP TS 23.018 [12].
Geodetic information	C	-	C	C	-	-	See 3GPP TS 23.018 [12].
VLR number	M	-	C	M	-	-	See 3GPP TS 23.018 [12].
Age Of location information	M	-	C	C	-	-	See 3GPP TS 23.018 [12].
Current Location Retrieved	-	-	-	-	-	-	Not applicable
Location area ID	C,E	-	C,E	C,E	-	-	See 3GPP TS 23.003 [7].
Selected LSA Identity	S	-	S	S	-	-	This IE indicates the LSA identity associated with the current position of the MS. It shall be present if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA ID with the highest priority shall be present. See 3GPP TS 23.073 [18]. This IE shall be present if available and SoLSA is supported, otherwise it shall be absent.

Carrier contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Carrier Identification Code	M	M	M	M	-	M	This IE uniquely identifies a North American long distance carrier.
Carrier Selection Information	M	M	M	M	-	M	This IE indicates the way the carrier was selected, i.e.: - dialled - subscribed

Service Interaction Indicators Two contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Forward Service Interaction Indicator	C	C	C	C	-	C	This IE is described in a table below.
HOLD Treatment Indicator	C	-	-	C	-	C	This IE indicates whether the CAMEL subscriber can invoke HOLD for the call.
CW Treatment Indicator	C	-	-	C	-	C	This IE indicates whether CW can be applied for a call to the CAMEL subscriber whilst this call is ongoing.
ECT Treatment Indicator	C	-	-	C	-	C	This IE indicates whether the call leg can become part of an ECT call initiated by the CAMEL subscriber.

Forward Service Interaction Indicator contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
--------------------------	----	----	----	----	----	----	-------------

Information element name	MO	MF	MT	VT	NC	NP	Description
Conference Treatment Indicator	C	C	C	C	-	C	This IE indicates whether the call leg can become part of a MPTY call initiated by the called subscriber.
Call Diversion Treatment Indicator	C	C	C	C	-	C	This IE indicates whether the call can be forwarded using the Call Forwarding or Call Deflection supplementary services.

-- Next modified section --

4.6.2 gsmSCF to gsmSSF information flows

...

4.6.2.19 Request Report BCSM Event

4.6.2.19.1 Description

This IF is used to request the gsmSSF to monitor for a call-related event, then send a notification back to the gsmSCF when the event is detected (see Event Report BCSM).

4.6.2.19.2 Information Elements

Information element name	MO	MF	MT	VT	NC	NP	Description
BCSM Event	M	M	M	M	M	M	This IE specifies the event or events for which a report is requested.

BCSM Event contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Event type	M	M	M	M	M	M	This IE specifies the type of event for which a report is requested.
Leg ID	C	C	C	C	C	M	This IE indicates the party in the call for which the event shall be armed or disarmed.
Monitor Mode	M	M	M	M	M	M	If this IE is "interrupted" then the event shall be reported as a request, if this IE is "notify and continue" then the event shall be reported as a notification, if this IE is "transparent" then the event shall not be reported.
DP Specific Criteria	O	O	O	O	O	O	This IE is described in a table below.
Automatic Rearm	O	O	O	O	-	-	This IE indicates that the detection point shall be automatically rearmed by the gsmSSF when it is encountered. This IE may be present only if the Event Type is O_Mid_Call, T_Mid_Call, O_Change_Of_Position, or T_Change_Of_Position, O_Service_Change, or T_Service_Change and the Monitor Mode is "notify and continue". The MF and MT cases apply for O_Service_Change, or T_Service_Change DPs only.

DP Specific Criteria contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Application Timer	O	O	O	O	O	O	This IE carries additional timer duration information (timer values for No_Answer event) required for arming the No_Answer EDPs in the gsmSSF. The TNRY timer (value defined between 10 seconds and 40 seconds) shall be shorter than the network no answer timer.
Mid Call Control Info	O	-	-	O	-	-	This IE is described in a table below. This IE carries the criterion for the detection and reporting of the mid-call event. If this IE is absent, then mid-call triggering shall take

Information element name	MO	MF	MT	VT	NC	NP	Description
							place when the first digit has been entered by the user.
Change of Position Control Info	O	-	-	O	-	-	This IE is described in a table below. It carries the list of criteria for the reporting of the change of position event. If the DP Specific Criteria IE is absent, then the criteria for any change of position shall be regarded as fulfilled.
NOTE If a Request Report BCSM Event information flow overwrites previous Request Report BCSM Event information flow which contained Application Timer IE for No_Answer DP, the behaviour of the gsmSSF is unpredictable.							

Mid Call Control Info contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Minimum Number Of Digits	M	-	-	M	-	-	This IE indicates the minimum number of digits to be collected. The value of this IE includes the length of the Start digit string, if present, and the length of the End of reply digit string, if present.
Maximum Number Of Digits	M	-	-	M	-	-	This IE indicates the maximum number of digits to be collected. The value of this IE includes the length of the Start digit string, if present, and the length of the End of reply digit string, if present. If triggering takes place due to the detection of the maximum number of digits and the End of reply digit string, if present, is partially detected, then the partially detected End of reply digit string shall be included in the digit string to be reported to the gsmSCF.
End of Reply Digit String	O	-	-	O	-	-	This IE, if present, indicates the digit string that denotes the end of the digits to be collected. If triggering takes place due to the detection of the End of reply digit string, then this string shall be included in the digit string to be reported to the gsmSCF. If the interdigit timeout expires when the Start Digit String, if present, is complete and the Minimum Number Of Digits has been detected and the End Digit String, if present, has been partially detected then triggering shall take place. The partially detected End Of Reply Digit String shall be included in the string to be reported to the gsmSCF.
Cancel Digit String	O	-	-	O	-	-	This IE, if present, indicates the digit string that indicates that the input shall be erased and that digit collection, including the start digit string, if present, shall start afresh.
Start Digit String	O	-	-	O	-	-	This IE, if present, indicates the digit string that denotes the start of the digits to be collected. If this IE is absent, then the first digit entered forms part of the digits to be collected. When triggering takes place, then the Start digit string shall be included in the digit string to be reported to the gsmSCF.
Inter Digit Timeout	M	-	-	M	-	-	This IE indicates the maximum duration allowed between receipt of successive digits from the MS

Change of Position Control Info contains a list of up to 10 instances of the following information element:

Information element name	MO	MF	MT	VT	NC	NP	Description
Change Of Location	M	-	-	M	-	-	Each Change Of Location IE is one of the 6 possibilities indicated in the table below. If multiple instances of the Change Of Location IE have the same value, this is not an error.

Each instance of the Change Of Location IE contains one of the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Cell Global ID	O,E	-	-	O,E	-	-	This IE indicates that the criteria are fulfilled if the mobile station performs handover across the boundary of the cell specified in this IE, i.e. handover into or out of the cell.
Service Area ID	O,E	-	-	O,E	-	-	This IE indicates that the criteria are fulfilled if the mobile station performs handover across the boundary of the service area specified in this IE, i.e. handover into or out of the service area.
Location Area ID	O,E	-	-	O,E	-	-	This IE indicates that the criteria are fulfilled if the mobile station performs handover across the boundary of the location area specified in this IE, i.e. handover into or out of the location area.
Inter-System Handover	O,E	-	-	O,E	-	-	This IE indicates that the criteria are fulfilled if the mobile station performs inter-system handover.
Inter-PLMN Handover	O,E	-	-	O,E	-	-	This IE indicates that the criteria are fulfilled if the mobile station performs inter-PLMN handover.
Inter-MSC Handover	O,E	-	-	O,E	-	-	This IE indicates that the criteria are fulfilled if the mobile station performs inter-MSC handover.