**Source:**      **TSG_N WG 2**

**Title:**      **CRs to 3G Work Item CAMEL phase 3 - Stage 2, Category F (2)**

**Agenda item:**   **6.2.2**

**Document for:**   **APPROVAL**

---

**Introduction:**

This document contains **8** CRs on **Work Item CAMEL phase 3** that have been agreed by **TSG_N WG 2,** and are forwarded to **TSG_N Plenary** meeting #8 for approval.

| Tdoc | Spec | CR | Rev | CAT | Rel. | Old Ver | New Ver | Subject |
|---|---|---|---|---|---|---|---|---|
| N2A000390 | 23.078 | 062 | 5 | F | R99 | 3.4.0 | 3.5.0 | Correction of SDL and IF for Dialled Services in Call Forwarding case |
| N2A000363 | 23.078 | 123 | 1 | F | R99 | 3.4.0 | 3.5.0 | Correction of incoming call handling |
| N2A000400 | 23.078 | 125 | 2 | F | R99 | 3.4.0 | 3.5.0 | Correction of Call Gapping |
| N2A000399 | 23.078 | 130 | 1 | F | R99 | 3.4.0 | 3.5.0 | Remove of SII2 frw CCBS treatment ind |
| N2A000329 | 23.078 | 132 | | F | R99 | 3.4.0 | 3.5.0 | Correction of the CWA SII2 description |
| N2-000230 | 23.078 | 133 | 2 | F | R99 | 3.4.0 | 3.5.0 | Improvements on ATM/ATSI/NSDC |
| N2A000397 | 23.078 | 138 | 1 | F | R99 | 3.4.0 | 3.5.0 | Reception of Int_QoS_Change in the gprsSSF in gsmSSF SDL |
| N2A000350 | 23.078 | 141 | | F | R99 | 3.4.0 | 3.5.0 | Correction on chapter 10. |

## CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| **23.078** | CR | **062r5** | Current Version: | **3.4.0** |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*      *↑ CR number as allocated by MCC support team*

| For submission to: | **CN#8** | for approval | **X** | strategic | | *(for SMG* |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | *use only)* |

*Form: CR cover sheet, version 2 for 3GPP and SMG*    *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**
*(at least one should be marked with an X)*

(U)SIM ☐    ME ☐    UTRAN / Radio ☐    Core Network **X**

| **Source:** | N2 | | **Date:** | 24th Mar. 2000 |
|---|---|---|---|---|

| **Subject:** | Correction of SDL and IF for Dialled Service in Call Forwarding case. |
|---|---|

| **Work item:** | CAMEL Phase 3 |
|---|---|

**Category:**

*(only one category shall be marked with an X)*

| | | | | **Release:** | | |
|---|---|---|---|---|---|---|
| F | Correction | **X** | | | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | | Release 96 | |
| B | Addition of feature | | | | Release 97 | |
| C | Functional modification of feature | | | | Release 98 | |
| D | Editorial modification | | | | Release 99 | **X** |
| | | | | | Release 00 | |

**Reason for change:**

Various IFs and SDL are missing for Dialled Services in Call Forwarding case:

- GMSC CCF SDL and HLR SDL for routeing information retrieval

- VMSC CCF SDL and VLR SDL for terminating call

- Information Flow Send Routeing Info Ack and Send Info For Incoming Call Ack

**Clauses affected:**    4.5.3.1, 4.5.3.2, 4.5.4.1, 4,5,4,2, 4.6.9.1, 4.6.13.3

**Other specs affected:**

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

**Other comments:**    N2A000243 is merged and Incoming call handling correction was moved to separate CR.

help.doc

<--------- double-click here for help and instructions on how to create a CR.

## 4.5.3     Retrieval of routeing information

### 4.5.3.1     Retrieval of routeing information in the GMSC

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

- Procedure CAMEL_Set_ORA_Parameters

- Procedure CAMEL_MT_GMSC_INIT

- 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

NOTE: Procedure CAMEL_MT_GMSC_DISC3 applies to CAMEL Phase 1 only.


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

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

### 4.5.3.1.1     Action of the GMSC on receipt of Int_Release_Call

An ISUP_Release is sent to the originating exchange and resources are released.

### 4.5.3.1.2     Action of the GMSC on receipt of Int_Error

The GMSC checks in T-CSI the default Call Handling parameter.

If the default call handling is release call, an ISUP_Release is sent to the originating exchange. The MSC then releases all call resources and the procedure CAMEL_MT_GMSC_INIT returns result=fail.

If the default call handling is continue call, the MSC continue call handling without CAMEL support.

### 4.5.3.1.3     Action of the GMSC on receipt of Int_Continue

If a FTN has been stored the information received from HLR is used to overwrite corresponding call parameters. Note that the MSISDN is replaced by the FTN as the Called party number. The redirection counter is incremented.

If no FTN has been stored, a Send Routeing Info message including a T-CSI suppression parameter is sent to the HLR. The Send Routing Info includes an indication which CAMEL Phases are supported by the GMSC/gsmSSF.

### 4.5.3.1.4 Action of the GMSC on receipt of Int_Continue_With_Argument

If an FTN has been stored, the information received from HLR is used to overwrite corresponding call parameters. The MSISDN is replaced by the FTN as the Called party number. The redirection counter is incremented.

If no FTN has been stored, a Send Routeing Info message including a T-CSI suppression parameter is sent to the HLR. The Send Routing Info includes an indication which CAMEL phases are supported by the GMSC/gsmSSF.

The MSC shall replace the call parameters by the information received in the Int_Continue_With_Argument message. Call parameters which are not included in the Int_Continue_With_Argument message are unchanged.

Signalling limitations or regulatory requirements may require the Calling Partys Category, Generic Number, Original Called Party Number and Redirecting Party ID to be ignored or modified.

### 4.5.3.1.5 Action of the GMSC on receipt of Int_Connect

If the Destination Number received from the gsmSCF (via the gsmSSF) is the same as the ISUP Called party number, i.e. the MSISDN, the following parameters, if received, are used to overwrite the corresponding ISUP parameters (for mapping see 3G TS 29.078 [5]): Calling Partys Category and Generic Number. If received, the Announcement Suppression Indicator is stored. The further processing is described in subclause 4.5.3.1.3 with the addition that the Announcement Suppression indicator, if stored, is sent to the HLR in the Send_Routeing_Info message.

If:

- the Destination Number received from the gsmSCF (via the gsmSSF) is not the same as the stored ISUP Called party number, i.e. the MSISDN; and

- a CUG active indication was received from the HLR ; and

- CUG information was received in the ISUP_IAM for the incoming call,

then an exception event is reported to the process gsmSSF, an ISUP_Release is sent to the originating exchange and all resources are released.

Otherwise the following parameters, if received, are used to overwrite the corresponding ISUP parameters (for mapping see 3G TS 29.078 [5]): Destination Number, Calling Partys Category, Generic Number, Original Called Party ID, Redirecting Party ID, Announcement Suppression Indicator, and Redirection Information. Call parameters that are not included in the Int_Connect message are unchanged.

As a network operator option loop prevention mechanisms may cause the redirection information to be ignored or modified (e.g., if the Redirection counter has been decreased).

Signalling limitations or regulatory requirements may require the Calling Partys Category, Generic Number, Original Called Party Number and Redirecting Party ID to be ignored or modified.

The network signalling system shall indicate that this is an internal network number.

### 4.5.3.1.6 Action of the GMSC on receipt of Send_Routeing_Info Negative Response (at state Wait_For_Routeing_Info_2)

An exception event is reported to the process gsmSSF. If the Announcement Suppression indicator has been received from the gsmSCF (via the gsmSSF) any announcements or tones shall be suppressed.

### 4.5.3.1.7 Action of the GMSC on receipt of Send_Routeing_Info ack with MSRN (at state Wait_For_Routeing_Info_2)

An ISUP_IAM with the MSRN as Called party number is constructed.

### 4.5.3.1.8 Action of the GMSC on receipt of Send_Routeing_Info ack with FTN (at state Wait_For_Routeing_Info_2)

The information received from HLR is used to overwrite corresponding call parameters (for details see 3G TS 23.018 [3]). The redirection counter is incremented.

### 4.5.3.1.9 Action of the GMSC on receipt of Send_Routeing_Info ack with O-CSI <u>and/or D-CSI</u> and FTN (at state Wait_For_Routeing_Info_2)

The information received from the HLR is used to overwrite corresponding call parameters. The redirection counter is incremented. The Called Party Number is set to FTN. <u>The O-CSI and/or D-CSI is stored.</u>

### 4.5.3.1.10 Action of the GMSC in procedure CAMEL_MT_ETC

In procedure CAMEL_MT_ETC (sheet 2) the GMSC will remain in the Wait_For_Assiting_Answer state until it receives an ISUP Answer Message (ANM) or timeout occurs. This is to ensure that a call record is always generated for every successful establishment of a temporary connection to a gsmSRF, especially in the case where the connection is between PLMNs.

NOTE: This means that it may not be possible to access an SRF which does not generate an ISUP Answer Message (ANM).

If a Progress message is sent towards the MS the progress indicator shall indicate "In Band Information".

### 4.5.3.1.11 Action of the GMSC in procedure CAMEL_MT_GMSC_Notify_CF

The Forwarding reason is taken from the Send Routeing Info ack (for early call forwarding) or the Resume Call Handling (for Optimal Routeing of Late Call Forwarding).

The Int_DP_T_No_Answer and Int_DP_T_Busy messages include a parameter to indicate that the call has encountered conditional call forwarding. The gsmSSF will transfer this parameter to the CAP_Event_Report_BCSM message which it sends to the gsmSCF.

**Figure 4.31a: Procedure CAMEL_MT_GMSC_INIT (sheet 1)**

Process in the GMSC
to perform CAMEL handling
for a terminating call request

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

Wait_For_
_Routeing
_Info_2

Send Routeing
Info Ack
/* FTN */ ← From HLR

Send Routeing
Info Ack
/* FTN, O-CSI
and/or D=CSI*/ ← From HLR

Send Routeing
Info Ack
/* MSRN */ ← From HLR

Store O-CSI and/or
D-CSI

Set redirection
information

Result:=
FTN

Result:=
MSRN
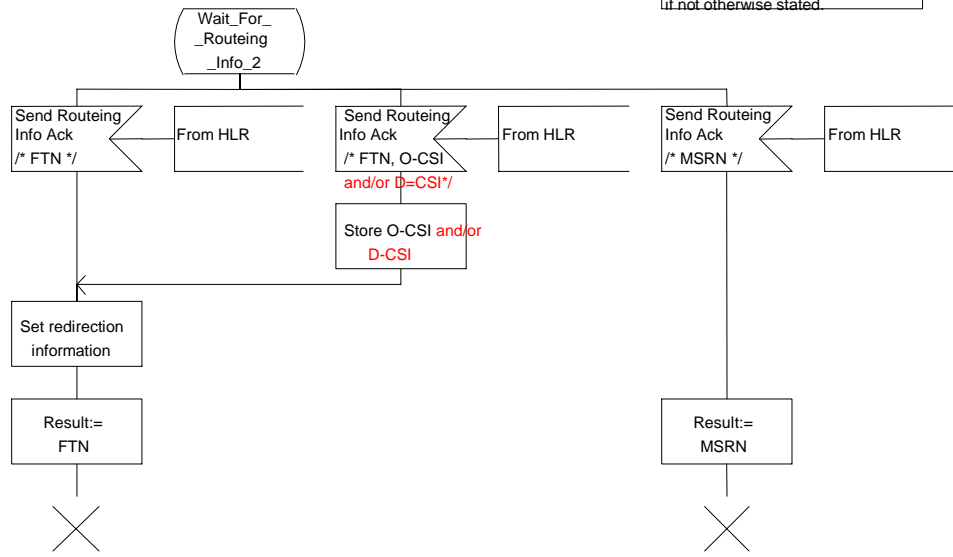
**Figure 4.31g: Procedure CAMEL_MT_GMSC_INIT (sheet 7)**

*6*

## 4.5.3.2 Retrieval of routeing information in the HLR

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

- CAMEL_HLR_INIT,

- CAMEL_CSI_Check_HLR,

- ———CAMEL_O_CSI_CHECK_HLR,

- CAMEL_D_CSI_CHECK_HLR,

- CAMEL_T_CSI_CHECK_HLR,

The procedure CAMEL_Provide_Subscriber_Info is specified in subclause 4.5.8.

/* This procedure in the HLR
to perform the handling for a
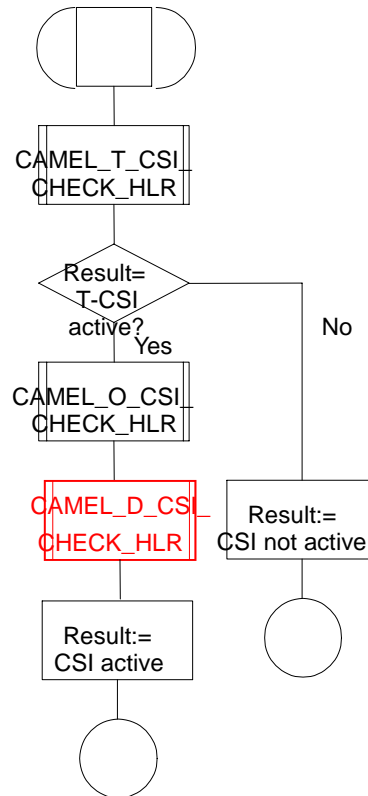forwarded CAMEL call. */

CAMEL_T_CSI_
CHECK_HLR

Result=
T-CSI
active?

No

Yes

CAMEL_O_CSI_
CHECK_HLR

CAMEL_D_CSI_
CHECK_HLR

Result:=
CSI not active

Result:=
CSI active

**Figure 4.43a: Procedure CAMEL_CSI_Check_HLR (sheet1)**

the O-CSI and set the O-CSI

parameter for SRI ack accordingly.

O-CSI
~~Present and active?~~Provisioned?

Set O-CSI
parameter
*(note1, note2)*

No
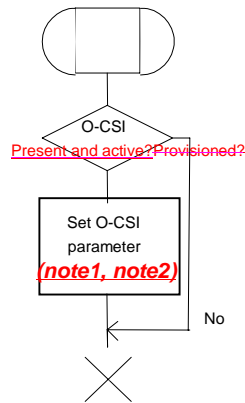
**Note 1**
In case of GSM call forwarding, as an implementation option, the HLR may perform conditional triggering check for DP Collected Info services in O-CSI.
If the check passes, O-CSI shall be sent to the GMSC without conditional triggering criteria for DP Collected info.
If the check fails, DP Collected Info triggers shall not be sent to the GMSC.

**Note 2**
The HLR shall not send O-CSI data to the GMSC if the GMSC does not support the indicated CAMEL Capability Handling in O-CSI.

**Figure 4.44a: Procedure CAMEL_O_CSI_CHECK_HLR (sheet 1)**

Procedure in the HLR to check
the D-CSI and set the D-CSI
parameter for SRI ack accordingly.

D-CSI
present and active?                No

Yes

CAMEL Phase 3
Supported in GMSC?                No

Yes

Set D-CSI
parameter
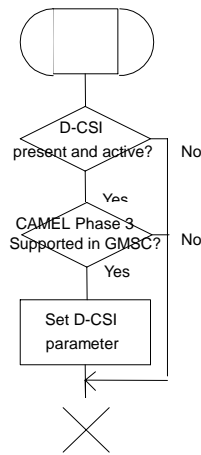
**Figure 4.44a_bis: Procedure CAMEL_D_CSI_CHECK_HLR (sheet 1) –new figure-**

*10*

Procedure in the HLR to
check the T-CSI and set the SRI ack
parameter accordingly

T-CSI
Present and active? provisioned?

No

Yes

Suppress
T-CSI?

Yes

No

Subscriber
info
required?

Yes

No

CAMEL_Provide_
Subscriber_
Info_HLR

Set T-CSI
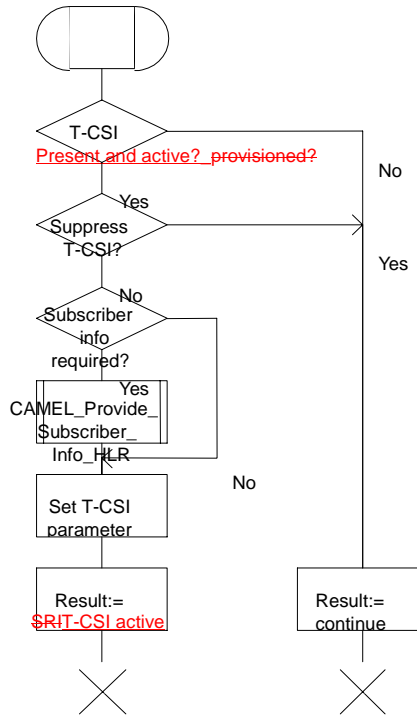parameter

Result:=
$RIT-CSI active

Result:=
continue

**Figure 4.45a: Procedure CAMEL_T_CSI_CHECK_HLR (sheet 1)**

## 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 3G TS 23.018 [3].

The behaviour specific to CAMEL is:

- the inclusion of the O-CSI and/or D-CSI parameter in the Perform Call Forwarding message sent to the process MT_CF_MSC if it was received in the Send Info For Incoming Call ack;

- 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.

The 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_T_CSI_Check_VLR

- Procedure CAMEL_ICH_MSC_INIT

- Procedure CAMEL_MT_VMSC_Notify_CF

### 4.5.4.1.1 Action of the VMSC in procedure CAMEL_MT_VMSC_Notify_CF

The Forwarding reason is taken from the Complete Call message from the VLR.

The Int_DP_T_No_Answer and Int_DP_T_Busy messages include a parameter to indicate that the call has encountered conditional call forwarding. The gsmSSF will transfer this parameter to the CAP_Event_Report_BCSM message which it sends to the gsmSCF.

Procedure in the VLR to check
the D-CSI and set the D-CSI
parameter for    SIFIC ack accordingly.

D-CSI
provisioned?

Yes

Set D-CSI
parameter

No
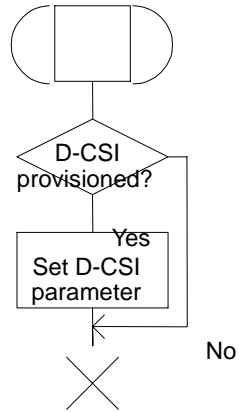
**Figure 4.48bis: Procedure CAMEL_D_CSI_Check_VLR (sheet 1) –new figure-**

*13*

## 4.5.4.2 Handling of mobile terminating calls in the VLR

The functional behaviour of the terminating VLR is specified in 3G TS 23.018 [3]. The process specific to CAMEL is specified in this subclause :

- Process Reconnected_MT_Call_VLR

The behaviour specific to CAMEL is:

- the inclusion of the O-CSI <u>and/or D-CSI</u> parameter in the Send Info For Incoming Call ack if the call is to be forwarded and O-CSI <u>and/or D-CSI</u> is included in the subscriber data for that subscriber in the;

- the inclusion of the suppression of announcements parameter in the Send Info For Incoming Call negative response if it was received in the Provide Roaming Number.

**Figure 4.52: Process Reconnected MT_Call_VLR (Sheet 1)**

## 4.6.9.1 Send Routeing Info ack

### 4.6.9.1.1 Description

This IF is specified in 3G TS 23.018 [3] and is used by the HLR to transfer the requested routeing information to the GMSC.

### 4.6.9.1.2 Information Elements

Send Routeing Info ack contains the following CAMEL specific IE:

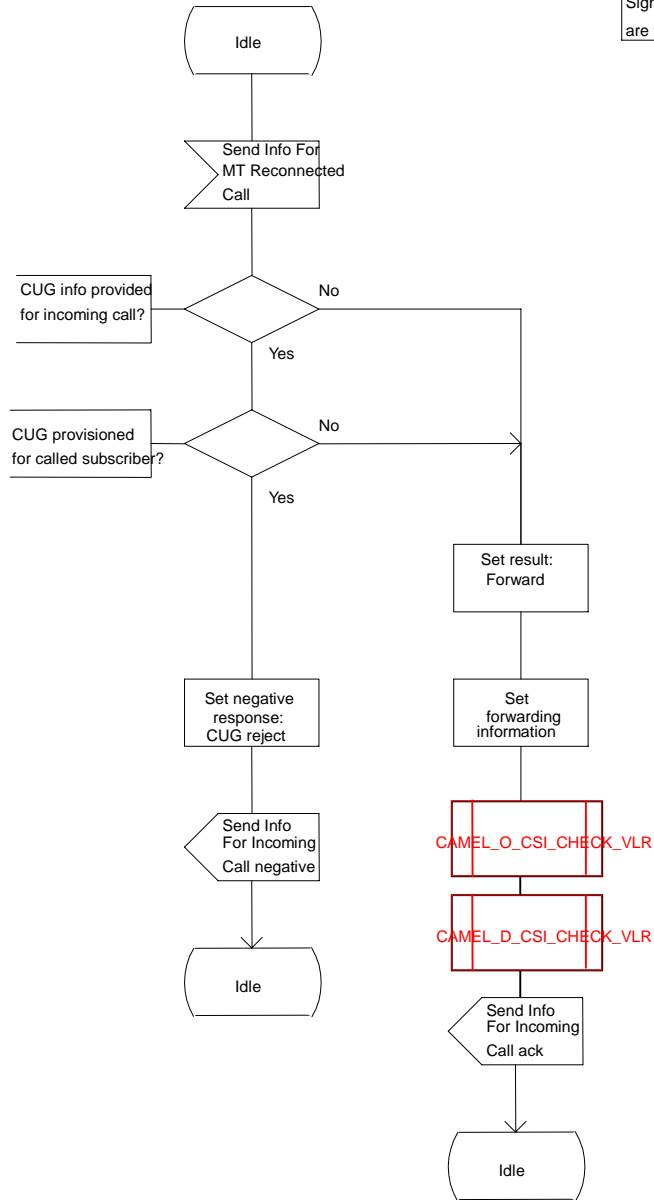| Information element name | Required | Description |
|---|---|---|
| Location Information | C | This IE indicates the location of the served subscriber. |
| O-CSI | C | This IE identifies the subscriber as having originating CAMEL services. <br><br> Shall be sent if O-CSI is active, and CFU or CFNRc has been invoked, or if both O-CSI and T-CSI are active. |
| D-CSI | C | This IE identifies the subscriber as having originating CAMEL dialled services. <br><br> Shall be sent if D-CSI is active, and CFU or CFNRc has been invoked, or if both D-CSI and T-CSI are active. |
| Subscriber State | C | This IE indicates the status of the MS. The possible values of the IE are: <br><br> - CAMELBusy: The VLR has indicated that the MS is engaged on a transaction for a mobile originating or terminated circuit-switched call. <br><br> - NetworkDeterminedNotReachable: The VLR has indicated that the network can determine from its internal data that the MS is not reachable. <br><br> - AssumedIdle: The VLR has indicated that the state of the MS is neither "CAMELBusy" nor "NetworkDeterminedNotReachable". <br><br> - NotProvidedFromVLR: The VLR did not provide any information on subscriber state even though it was requested. |
| T-CSI | C | This IE identifies the subscriber as having terminating CAMEL services. <br><br> Shall be sent if T-CSI is active and no Suppress T-CSI indicator is present in the SRI. |
| Basic Service Code | C | This IE indicates the type of basic service i.e., teleservice or bearer service. |
| CUG Subscription Flag | C | This IE indicates if the called party has a CUG subscription. It shall only be sent if the T-CSI is active and included in the Send Routing Information ack. |

C  Conditional (The IE shall be sent, if available)

Location Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| Location Number | C | See 3G TS 23.018 [3]. The IE shall be sent, if available and indicated by Subscriber Information in Send Routeing Information ack indicator. |
| CellGlobalIdOrServiceAreaIdOrLAI | C | See 3G TS 23.018 [3]. The IE shall be sent, if available and indicated by Subscriber Information in Send Routeing Information ack indicator. |
| Geographical Information | C | See 3G TS 23.018 [3]. The IE shall be sent, if available and indicated by Subscriber Information in Send Routeing Information ack indicator. |
| Geodetic Information | C | See 3G TS 23.018 [3]. The IE shall be sent, if available and indicated by Subscriber Information in Send Routeing Information ack indicator. |
| Age Of Location Information | C | See 3G TS 23.018 [3]. The IE shall be sent, if available and indicated by Subscriber Information in Send Routeing Information ack indicator. |
| VLR number | C | See 3G TS 23.018 [3]. |
| Selected LSA Identity | C | See 3G TS 23.018 [3]. The IE shall be sent, if available and indicated by Subscriber Information in Send Routeing Information ack indicator. |

C   Conditional (The IE shall be sent, if available. Further conditions are in the description column.)

O-CSI is defined in section 4.3.1.

D-CSI is defined in section 4.3.2.

T-CSI contains the following information:

| Information element name | Required | Description |
|---|---|---|
| gsmSCF Address | M | This IE is described in section 4.3.3. |
| Service Key | M | This IE is described in section 4.3.3. |
| Default Call Handling | M | This IE is described in section 4.3.3. |
| TDP List | M | This IE is described in section 4.3.3. |
| CAMEL Capability Handling | C | This IE is described in section 4.3.3. If this IE is absent, this indicates that CAMEL phase 1 is asked. |

M   Mandatory

C   Conditional

## 4.6.13.3     Send Info For Incoming Call ack

### 4.6.13.3.1     Description

This IF is described in 3G TS 23.018 [3] and is used to indicate that the incoming call for which the MSC requested subscription information shall be forwarded.

### 4.6.13.3.1     Information Elements

Send Info For Incoming Call ack contains the following CAMEL specific IE:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | This IE indicates that originating  CAMEL service handling applies for a forwarded call.<br>Shall be present if originating CAMEL service handling applies; otherwise shall be absent. |
| D-CSI | C | This IE indicates that originating CAMEL dialled service handling applies for a forwarded call.<br>Shall be present if originating CAMEL dialled service handling applies; otherwise shall be absent. |
| VT-CSI | C | This IE identifies the subscriber as having terminating CAMEL services in the VMSC. |
| Suppression Of Announcement | C | This IE indicates that announcements or tones generated when the call is forwarded shall be suppressed.<br>Shall be sent if it was received in the Provide Roaming Number for this call. |
| Call Reference Number | M | This IE carries the Call Reference Number provided by the HLR in the Provide Roaming Number IF. |
| GMSC Address | M | This IE is the E.164 address of the GMSC. |

M   Mandatory (The IE shall always be sent)

C   Conditional (The IE shall be sent if applicable)

## CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| **23.078** | CR | **123r1** | Current Version: | **3.4.0** |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*          *↑ CR number as allocated by MCC support team*

| For submission to: | CN#8 | for approval | **X** | strategic | | *(for SMG* |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | *use only)* |

*Form: CR cover sheet, version 2 for 3GPP and SMG          The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**     (U)SIM ☐    ME ☐    UTRAN / Radio ☐    Core Network **X**
*(at least one should be marked with an X)*

| **Source:** | N2 | | **Date:** | 28th Mar. 2000 |
|---|---|---|---|---|

| **Subject:** | Correction of incoming call handling |
|---|---|

| **Work item:** | CAMEL Phase 3 |
|---|---|

**Category:**

*(only one category shall be marked with an X)*

| | | | Release: | |
|---|---|---|---|---|
| F | Correction | **X** | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | Release 96 | |
| B | Addition of feature | | Release 97 | |
| C | Functional modification of feature | | Release 98 | |
| D | Editorial modification | | Release 99 | **X** |
| | | | Release 00 | |

| **Reason for change:** | The definition of Continue CAMEL handling IF and Suppress VT-CSI information element was missing. VLR modelling of second interrogation also requires correction |
|---|---|

| **Clauses affected:** | 4.5.4.1, 4.6.12, 4.6.13 |
|---|---|

| **Other specs affected:** | Other 3G core specifications | **X** | → List of CRs: | 23.018CR045r1 |
|---|---|---|---|---|
| | Other GSM core specifications | | → List of CRs: | |
| | MS test specifications | | → List of CRs: | |
| | BSS test specifications | | → List of CRs: | |
| | O&M specifications | | → List of CRs: | |

| **Other comments:** | N2A000155 and N2A000222 are merged. |
|---|---|

help.doc

<--------- double-click here for help and instructions on how to create a CR.

# 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 3G TS 23.018 [3].

The behaviour specific to CAMEL is:

- the inclusion of the O-CSI parameter in the Perform Call Forwarding message sent to the process MT_CF_MSC if it was received in the Send Info For Incoming Call ack;

- 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.

The procedures specific to CAMEL are specified in this subclause :

- Procedure CAMEL_ICH_VLR

- Procedure CAMEL_O_CSI_Check_VLR

- Procedure CAMEL_VT_CSI_Check_VLR

- Procedure CAMEL_ICH_MSC_INIT

- Procedure CAMEL_MT_VMSC_Notify_CF

### 4.5.4.1.1          Action of the VMSC in procedure CAMEL_MT_VMSC_Notify_CF

The Forwarding reason is taken from the Complete Call message from the VLR.

The Int_DP_T_No_Answer and Int_DP_T_Busy messages include a parameter to indicate that the call has encountered conditional call forwarding. The gsmSSF will transfer this parameter to the CAP_Event_Report_BCSM message which it sends to the gsmSCF.

/* This procedure is called in
ICH_VLR (in GSM 03.18) */
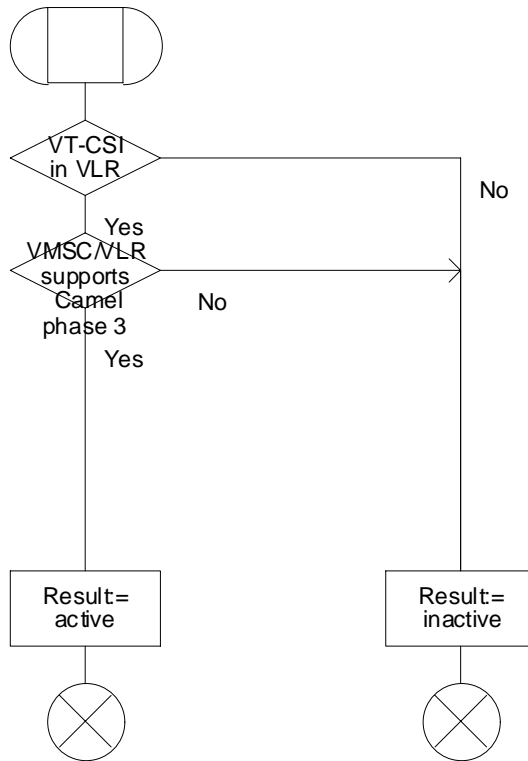
```
                          ┌───┬───┐
                          │   │   │
                          └───┴───┘
                              │
                           ╱──┴──╲
                          ╱ VT-CSI ╲              No
                          ╲ in VLR  ╱──────────────────────────┐
                           ╲──┬──╱                             │
                              │ Yes                            │
                         ╱────┴────╲                           │
                        ╱ VMSC/VLR  ╲                          │
                       ╱  supports    ╲        No              │
                       ╲  Camel       ╱────────────────────────►
                        ╲ phase 3    ╱                         │
                         ╲────┬────╱                           │
                              │ Yes                            │
                              │                                │
                        ┌─────┴─────┐                   ┌──────┴────┐
                        │  Result=  │                   │  Result=  │
                        │  active   │                   │  inactive │
                        └─────┬─────┘                   └──────┬────┘
                              │                                │
                            ╱─┴─╲                            ╱─┴─╲
                           │  ⊗  │                          │  ⊗  │
                            ╲───╱                            ╲───╱
```

**Figure 4.47: Procedure CAMEL_ICH_VLR (sheet 1) –old-**

/* This procedure is called in
ICH_VLR (in TS 23.018) */

VMSC/VLR
supports
Camel
phase 3

No

Yes

CAMEL_VT_CSI_CHECK_VLR

Result= CCH?

No

Yes

Continue
CAMEL
Handling

Wait_for_
SIFIC_2

Abort

Send Info For
Incoming Call

Result=
Fail

Result:=
Pass

Result:=
Pass
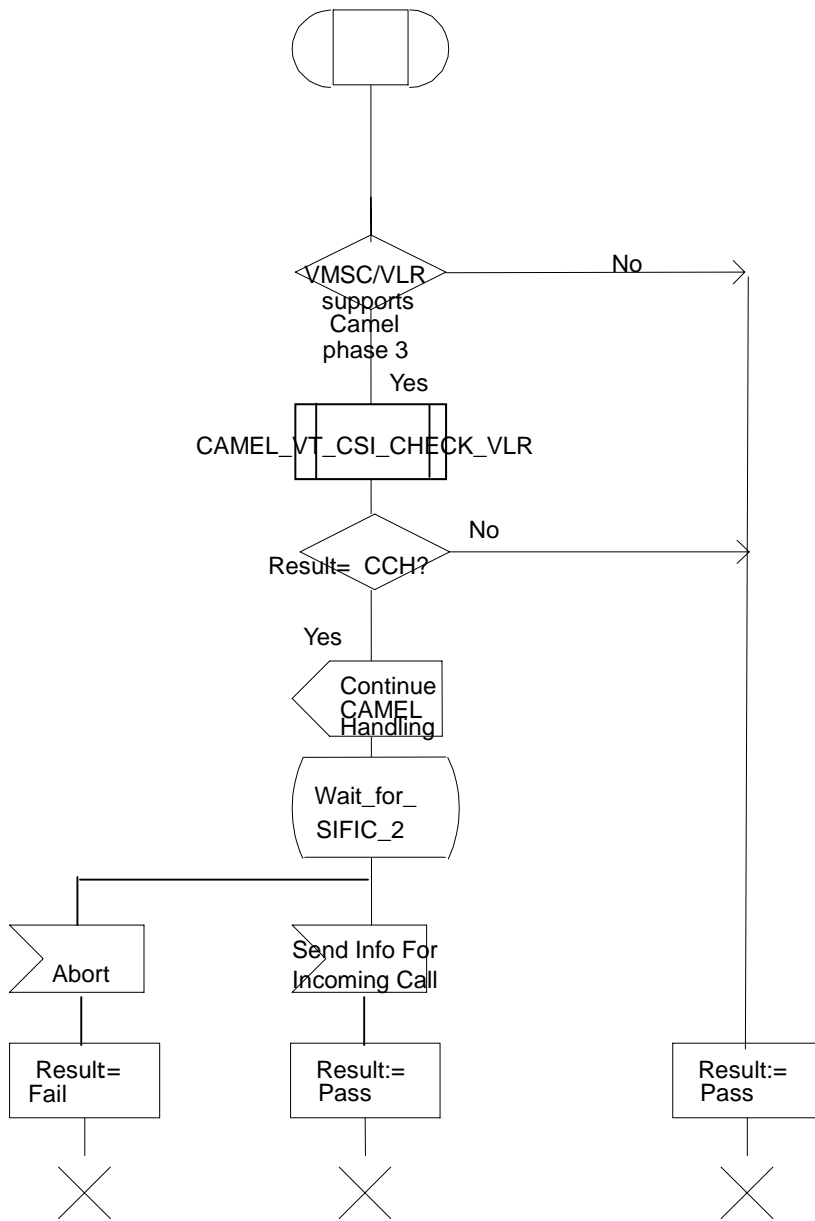
**Figure 4.47: Procedure CAMEL_ICH_VLR (sheet 1) –new-**

*4*

/* Procedure in the VLR to
check the VT-CSI and set the SIFIC ack
parameter accordingly */

VT-CSI
provisioned? — No

Yes

Suppress
VT-CSI? — Yes

No

Criteria
applicable? — No

- Check basic service code criteria
- Check VT-CSI in VMSC-B

Yes

Criteria
fulfilled? — No

No

Yes

Set VT-CSI
parameter

Result:=
SIFIC CCH

Result:=
continue
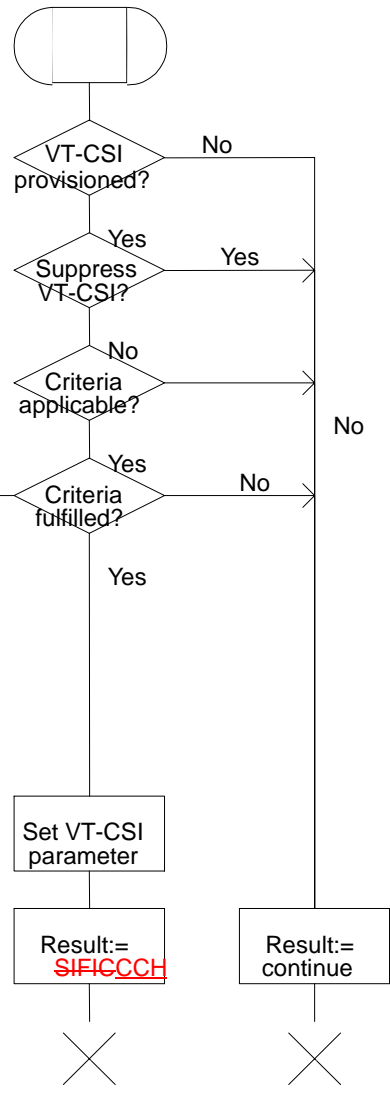
**Figure 4.49: Procedure CAMEL_VT_CSI_Check_VLR (sheet 1)**

*5*

/* Process in the VMSC-B to handle a terminating call request */

/* Signals to/from the right are to/from the gsmSSF */

Content of SIFIC ack

VT-CSI

VT-CSI
O-CSI

O-CSI

set
CSI=VT-CSI

Set
CSI=VT-CSI

Set
CSI=O-CSI

Store O-CSI

Result=
MSRN

Int_Invoke
gsmSSF
(VT-CSI)

wait_for_
gsmSSF_Invoked

**Figure 4.50a: Procedure CAMEL_ICH_MSC_INIT (sheet 1) –old-**

/* Process in the VMSC-B
to handle a
terminating call request */

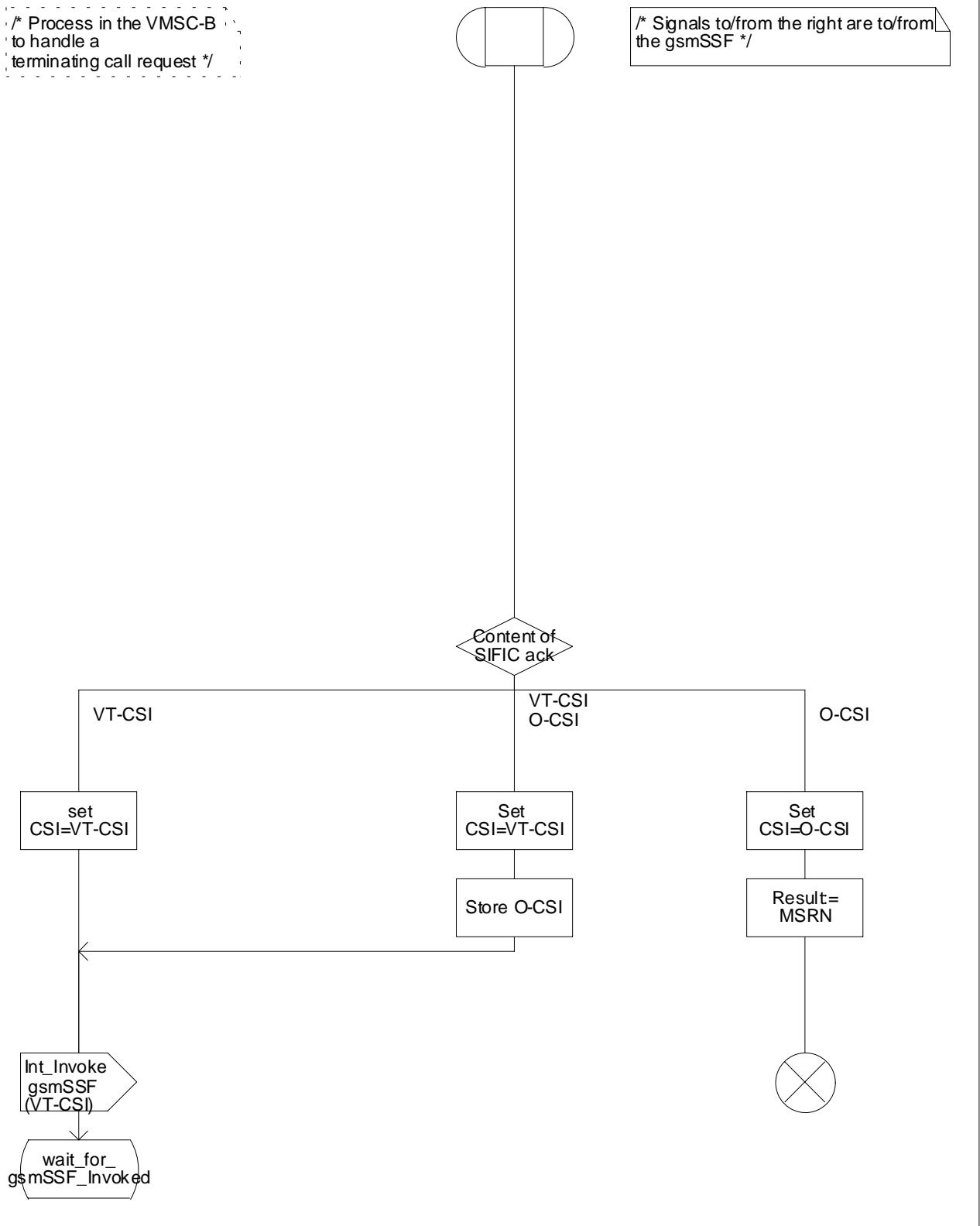/* Signals to/from the right are to/from
the gsmSSF */

set
CSI=VT-CSI

Int_Invoke
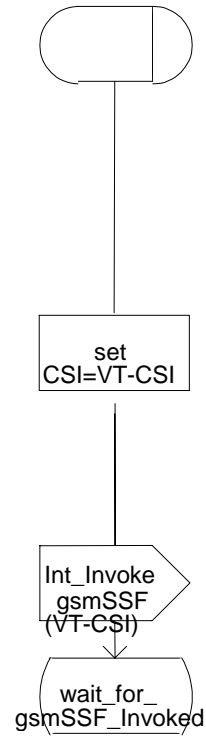gsmSSF
(VT-CSI)

wait_for_
gsmSSF_Invoked

**Figure 4.50a: Procedure CAMEL_ICH_MSC_INIT (sheet 1) –new-**

## 4.6.12    MSC to VLR information flows

### 4.6.12.1        Send Info For Incoming Call

#### 4.6.12.1.1        Description

This IF is described in 3G TS 23.018 [3] and is used to request the VLR to provide information to handle an incoming call.

#### 4.6.12.1.2        Information Elements

Send Info For Incoming Call contains the following CAMEL specific IE

| Information element name | Required | Description |
|---|---|---|
| Suppress VT-CSI | C | This IE indicates that VT-CSI shall be suppressed. Shall never be sent in the first interrogation; shall always be sent in the second interrogation. |

C   Conditional (The IE shall be sent if applicable)

### 4.6.12.21    Send Info For Outgoing Call

#### 4.6.12.21.1        Description

This IF is described in 3G TS 23.018 [3] and is used to request the VLR to provide information to handle an outgoing call.

#### 4.6.12.21.2        Information Elements

Send Info For Outgoing Call contains the following CAMEL specific IE

| Information element name | Required | Description |
|---|---|---|
| Suppress O-CSI | C | This IE indicates that O-CSI shall be suppressed. Shall always be sent in the second interrogation. |
| Suppress D-CSI | C | This IE indicates that D-CSI shall be suppressed. Shall always be sent in the second interrogation. |
| N-CSI available | C | This IE indicates that N-CSI is available in MSC. Shall be sent in the first interrogation if N-CSI is available in MSC. |

C   Conditional (The IE shall be sent if applicable)

### 4.6.12.23    Send Info For Reconnected Call

#### 4.6.12.32.1        Description

This IF is used to request the VLR to provide information to handle a reconnected call.

#### 4.6.12.32.2        Information Elements

Send Info For Reconnected Call contains the following IE

| Information element name | Required | Description |
|---|---|---|
| Called number | M | E.164 number of the call destination. |
| Bearer service | C | Bearer service required for the MO call, derived from the GSM bearer capability information received in the setup request from the MS. One of bearer service or teleservice shall be present. |
| Teleservice | C | Teleservice required for the MO call, derived from the GSM bearer capability information received in the setup request from the MS or from the emergency setup request from the MS. One of bearer service or teleservice shall be present. |
| CUG index | C | For the definition of this IE, see 3G TS 23.085 [9]. Shall be present if it was received in the setup request from the MS. |
| Suppress preferential CUG | C | For the definition of this IE, see 3G TS 23.085 [9]. Shall be present if it was received in the setup request from the MS. |
| Suppress CUG outgoing access | C | For the definition of this IE, see 3G TS 23.085 [9]. Shall be present if it was received in the setup request from the MS. |
| Suppress O-CSI | C | This IE indicates that O-CSI shall be suppressed. Shall always be sent in the second interrogation. |

M  Mandatory (The IE shall always be sent)

C  Conditional (The IE shall be sent if applicable)

## 4.6.13    VLR to MSC information flows

### 4.6.13.1    Complete Call

#### 4.6.13.1.1    Description

This IF is described in 3G TS 23.018 [3] and is used to instruct the MSC to continue the connection of a call.

#### 4.6.13.1.2    Information Elements

Complete Call contains the following CAMEL specific IE:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | This IE indicates that CAMEL handling applies for an MO call. Shall be present in the response to the first interrogation for an MO call if CAMEL handling applies; otherwise shall be absent. Shall be absent in the response to the second interrogation for an MO call and in the response to the interrogation for an MT call. |
| D-CSI | C | This IE identifies the subscriber as having originating CAMEL dialled services. |
| ~~VT-CSI~~ | ~~C~~ | ~~This IE identifies the subscriber as having terminating CAMEL services in the VMSC.~~ |
| Call Reference Number | M | This IE carries the Call Reference Number provided by the HLR in the Provide Roaming Number IF. |
| GMSC Address | M | This IE is the E.164 address of the GMSC. |

M  Mandatory (The IE shall always be sent)

C  Conditional (The IE shall be sent if applicable)

### 4.6.13.2    Continue CAMEL Handling

#### 4.6.13.2.1    Description

This IF is used to instruct the MSC to continue the CAMEL specific handling.

### 4.6.13.2.2    Information Elements

Continue CAMEL Handling contains the following IE:

| Information element name | Required | Description |
|---|---|---|
| VT-CSI | M | This IE identifies the subscriber as having terminating CAMEL services in the VMSC. |
| IMSI | M | IMSI of the B subscriber. |
| MSISDN | C | E.164 number which identifies the B subscriber. It will be used to create the redirecting number presented to the C subscriber. Shall be present if the call is to be forwarded, otherwise shall be absent. |
| CUG interlock | C | For the definition of this IE, see 3G TS 23.085 [9]. Shall be present if the VLR has determined that the forwarded call is to be treated as a CUG call in accordance with the rules in 3G TS 23.085 [9], otherwise shall be absent. |
| CUG outgoing access | C | For the definition of this IE, see 3G TS 23.085 [9]. Shall be present if the VLR has determined that the forwarded call is to be treated as a CUG call with outgoing access in accordance with the rules in 3G TS 23.085 [9], otherwise shall be absent. |
| Location information | C | Information to define the location of the MS: see definition in 3G TS 23.018[3]. Shall be present if location information was requested and is available; otherwise shall be absent. |
| GMSC-Address | M | The E.164 address of the GMSC which was received in the Provide Roaming Number. |
| Call Reference Number | M | This IE carries the Call Reference Number provided by the HLR in the Provide Roaming Number IF. |
| ExtBasic Service Code | C | This IE indicates the type of basic service i.e., teleservice or bearer service. |

M  Mandatory (The IE shall always be sent)

C  Conditional (The IE shall be sent if applicable)

## 4.6.13.3~~2~~    Process Call Waiting

### 4.6.13.3~~2~~.1    Description

This IF is described in 3G TS 23.018 [3] and is used to instruct the MSC to continue the connection of a waiting call.

### 4.6.13.3~~2~~.2    Information Elements

Process Call Waiting contains the following CAMEL specific IE:

| Information element name | Required | Description |
|---|---|---|
| Call Reference Number | M | This IE carries the Call Reference Number provided by the HLR in the Provide Roaming Number IF. |
| GMSC Address | M | This IE is the E.164 address of the GMSC. |

M  Mandatory (The IE shall always be sent)

## 4.6.13.4~~3~~    Send Info For Incoming Call ack

### 4.6.13.4~~3~~.1    Description

This IF is described in 3G TS 23.018 [3] and is used to indicate that the incoming call for which the MSC requested subscription information shall be forwarded.

### 4.6.13.4~~3~~.1    Information Elements

Send Info For Incoming Call ack contains the following CAMEL specific IE:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | This IE indicates that CAMEL handling applies for a forwarded call.<br>Shall be present if CAMEL handling applies; otherwise shall be absent. |
| ~~VT-CSI~~ | ~~C~~ | ~~This IE identifies the subscriber as having terminating CAMEL services in the VMSC.~~ |
| Suppression Of Announcement | C | This IE indicates that announcements or tones generated when the call is forwarded shall be suppressed.<br>Shall be sent if it was received in the Provide Roaming Number for this call. |
| Call Reference Number | M | This IE carries the Call Reference Number provided by the HLR in the Provide Roaming Number IF. |
| GMSC Address | M | This IE is the E.164 address of the GMSC. |

M Mandatory (The IE shall always be sent)

C Conditional (The IE shall be sent if applicable)

## 4.6.13.54 Send Info For Incoming Call negative response

### 4.6.13.54.1 Description

This IF is described in 3G TS 23.018 [3] and is used to indicate that the incoming call for which the MSC requested subscription information shall not be connected.

### 4.6.13.54.2 Information Elements

Send Info For Incoming Call negative response contains the following CAMEL specific IE which may be attached as a IE to any of the negative response values defined in 3G TS 23.018 [3]:

| Information element name | Required | Description |
|---|---|---|
| Suppression Of Announcement | C | This IE indicates that announcements or tones generated as a result of unsuccessful call setup shall be suppressed.<br>Shall be sent if it was received in the Provide Roaming Number for this call. |

C Conditional (The IE shall be sent if applicable)

*e.g. for 3GPP use the format  TP-99xxx*
*or for SMG, use the format  P-99-xxx*

| | | |
|---|---|---|
| **CHANGE REQUEST** | | *Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.* |

**23.078** CR **125r2**    Current Version:   3.4.0

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*          *↑ CR number as allocated by MCC support team*

For submission to:   **CN#8**          for approval  **X**          strategic   ☐   *(for SMG*
*list expected approval meeting # here ↑*          for information  ☐          non-strategic  ☐   *use only)*

*Form: CR cover sheet, version 2 for 3GPP and SMG          The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**          (U)SIM ☐          ME ☐          UTRAN / Radio ☐          Core Network **X**
*(at least one should be marked with an X)*

| | | | |
|---|---|---|---|
| **Source:** | N2 | **Date:** | 31/03/00 |

**Subject:**          Correction of Call Gapping procedure

**Work item:**          CAMEL phase 3

| **Category:** | | | | | **Release:** | | |
|---|---|---|---|---|---|---|---|
| | F | Correction | | **X** | | Phase 2 | ☐ |
| | A | Corresponds to a correction in an earlier release | | ☐ | | Release 96 | ☐ |
| *(only one category* | B | Addition of feature | | ☐ | | Release 97 | ☐ |
| *shall be marked* | C | Functional modification of feature | | ☐ | | Release 98 | ☐ |
| *with an X)* | D | Editorial modification | | ☐ | | Release 99 | **X** |
| | | | | | | Release 00 | ☐ |

**Reason for change:**          Correction in the procedure Check_Gap_Criteria, figure 4.65. The sentence in the box is wrong, the Call Gap treatment is applicable ONLY if present and if  Default call handling is set to release. Howewer, the procedure Check_Gap_Criteria doesn't treat the handling of the call in case the call is gapped, for this reason this sentence shall be removed.

**Clauses affected:**          Figure 4.65

| **Other specs affected:** | | | |
|---|---|---|---|
| | Other 3G core specifications | ☐ | → List of CRs: |
| | Other GSM core specifications | ☐ | → List of CRs: |
| | MS test specifications | ☐ | → List of CRs: |
| | BSS test specifications | ☐ | → List of CRs: |
| | O&M specifications | ☐ | → List of CRs: |

**Other comments:**          This is a rework of TDOC377

help.doc

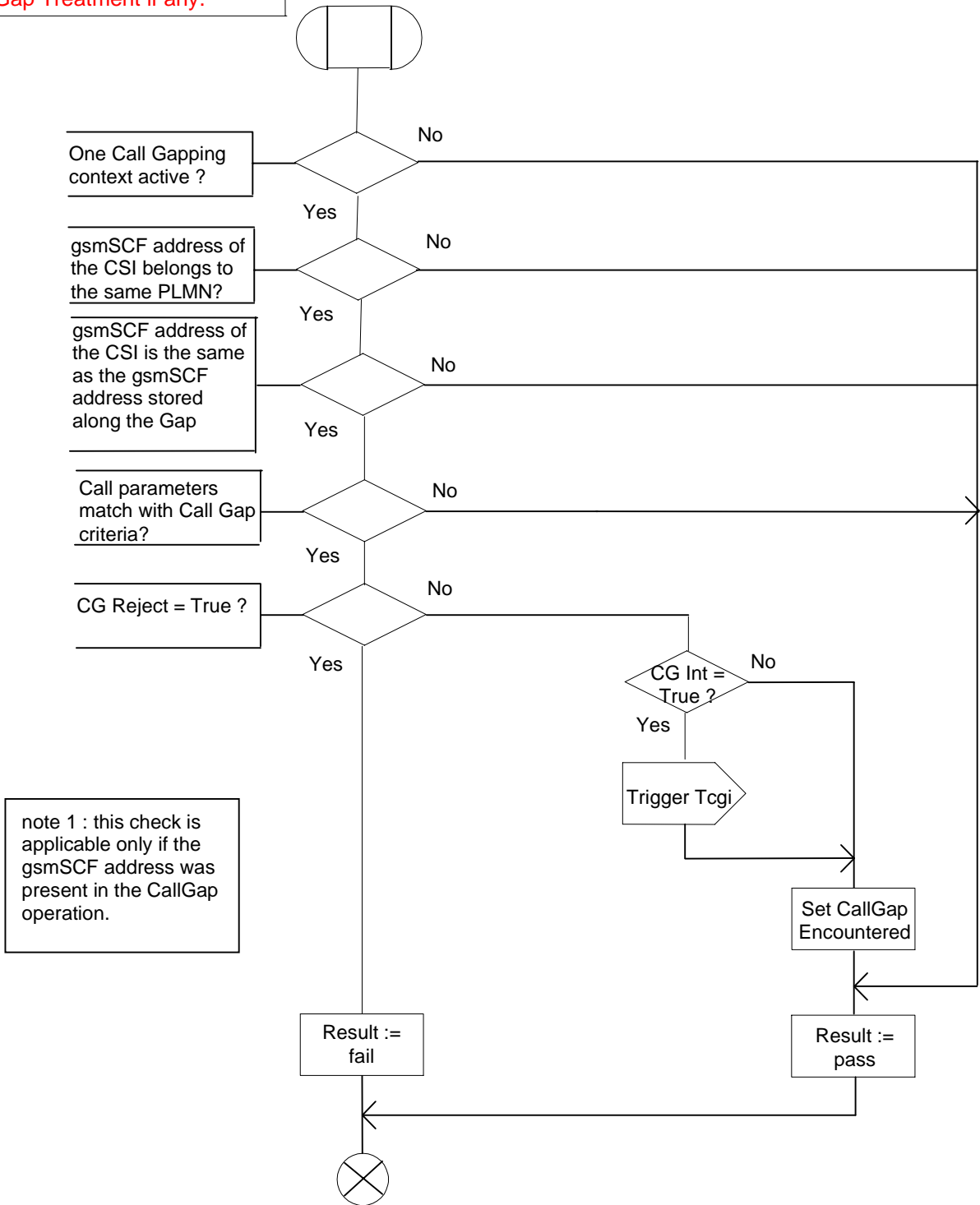<--------- double-click here for help and instructions on how to create a CR.

**Figure ~~x.x.x~~4.65 : Procedure Check_Gap_criteria**

**3GPP TSG CN WG2#8**
**Charleston, South Carolina, USA**
**27-31 March 2000**

*Document* **N2A000399**

*e.g. for 3GPP use the format  TP-99xxx*
*or for SMG, use the format  P-99-xxx*

# CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| **23.078** | CR | **130r1** | Current Version: | 3.4.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*              *↑ CR number as allocated by MCC support team*

| For submission to: | CN #8 | for approval | X | strategic | | *(for SMG* |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | *use only)* |

*Form: CR cover sheet, version 2 for 3GPP and SMG       The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**      (U)SIM ☐      ME ☐      UTRAN / Radio ☐      Core Network **X**
*(at least one should be marked with an X)*

| **Source:** | N2 | | **Date:** | 30.03.2000 |
|---|---|---|---|---|

| **Subject:** | Remove of the SII2 forward CCBS treatment indicator |
|---|---|

| **Work item:** | CAMEL phase |
|---|---|

**Category:**

| | | | | | **Release:** | | |
|---|---|---|---|---|---|---|---|
| | F | Correction | | X | | Phase 2 | |
| | A | Corresponds to a correction in an earlier release | | | | Release 96 | |
| *(only one category* | B | Addition of feature | | | | Release 97 | |
| *shall be marked* | C | Functional modification of feature | | | | Release 98 | |
| *with an X)* | D | Editorial modification | | | | Release 99 | X |
| | | | | | | Release 00 | |

| **Reason for change:** | The usage of the Connect and ContinueWithArgument operations SII2 forward CCBS treatement indicator is not nessessary in MO, because the same network functionality can be reached using backward CCBS treatement indicator in MO i.e. after the backward CCBS treatement indicator ignores the possibility to request the CCBS, it is not anymore nessessary to reject CCBS request. |
|---|---|

| **Clauses affected:** | 4.6.2.6.2 |
|---|---|

| **Other specs affected:** | Other 3G core specifications | | → List of CRs: | CR 29.078-065 |
|---|---|---|---|---|
| | Other GSM core specifications | | → List of CRs: | |
| | MS test specifications | | → List of CRs: | |
| | BSS test specifications | | → List of CRs: | |
| | O&M specifications | | → List of CRs: | |

| **Other comments:** | The CS-2 INAP does not support forward CCBS treatment indicator even the same network functionality is available for ISDN users. |
|---|---|

****  **FIRST MODIFIED SECTION**   ****

## 4.6.2.6      Connect

### 4.6.2.6.1      Description

This IF is used to request the gsmSSF to perform the call processing actions to route a call to a specific destination. To do so, the gsmSSF may use destination information from the calling party and existing call set-up information depending on the information provided by the gsmSCF.

### 4.6.2.6.2      Information Elements

The following information elements are required:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| Alerting Pattern | - | - | O | O | This parameter indicates the kind of Alerting Pattern to be applied. |
| Calling Partys Category | O | O | O | O | This IE indicates the type of calling party (e.g., operator, pay phone, ordinary subscriber). |
| Destination Routing Address | M | M | M | M | This IE contains the called party number towards which the call is to be routed. |
| Generic Number | O | O | O | O | This IE contains the generic number. Its used to convey the additional calling party number, which e.g. could be used to modify the calling line ID presented to the called user. |
| NA Carrier Information | O | O | O | O | This IE is described in the next table. |
| NA Originating Line Information | O | O | O | O | This IE identifies the type of number in the NA Charge Number (e.g. subscriber versus PLMN operator number). |
| NA Charge Number | O | O | O | O | This IE identifies the chargeable number for the usage of a North American carrier. |
| O-CSI Applicable | - | - | O | O | This IE indicates that the O-CSI, if present shall be applied on the outgoing leg. |
| Original Called Party ID | O | O | O | O | This IE carries the dialled digits if the call has met call forwarding on route to the gsmSSF or is forwarded by the gsmSCF. |
| Redirecting Party ID | O | O | O | O | This IE indicates the directory number the call was redirected from. |
| Redirection Information | O | O | O | O | This IE contains forwarding related information, such as redirecting counter. |
| Suppression Of Announcements | - | - | O | O | This IE indicates that announcements or tones generated as a result of unsuccessful call setup shall be suppressed. |
| Service Interaction Indicators Two | O | O | O | O | This IE is described in a table below. |
| CUG Interlock Code | O | O | O | O | See 3G TS 23.085 [9] for details of this IE. |
| Outgoing Access Indicator | O | O | O | O | See 3G TS 23.085 [9] for details of this IE. |
| Non-CUG Call | O | O | O | O | This IE indicates that no parameters for CUG should be used for the call (i.e. the call should be a non-CUG call). |

  O   Optional (Service logic dependent)

  -   Not applicable

Non-CUG Call shall not be present if at least one of CUG Interlock Code and Outgoing Access Indicator are present.

NA Carrier Information contains the following information:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| NA Carrier Identification Code | M | M | M | M | This IE uniquely identifies a North American long distance carrier. |
| NA Carrier Selection Information | M | M | M | M | This IE indicates the way the carrier was selected e.g.:<br>– dialled<br>– subscribed |

M Mandatory (The IE shall always be sent)

Service Interaction Indicators Two contains the following information:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| Forward Service Interaction Indicator | O | O | O | O | This IE is described in a table below. |
| Backward Service Interaction Indicator | O | O | O | O | This IE is described in a table below. |
| HOLD Treatment Indicator | O | - | - | O | This IE indicates whether the CAMEL subscriber can invoke HOLD for the call. |
| CW Treatment Indicator | O | - | - | O | This IE indicates whether CW can be applied for a call to the CAMEL subscriber whilst this call is ongoing. |
| ECT Treatment Indicator | O | - | - | O | This IE indicates whether the call leg can become part of an ECT call initiated by the CAMEL subscriber. |
|  |  |  |  |  |  |
| Connected number treatment indicator | O | O | O | O | This IE indicates the treatment of the connected number at the originating side. |

O Optional (Service logic dependent)

- Not applicable

Forward Service Interaction Indicator contains the following information:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| Conference Treatment Indicator | O | O | O | O | This IE indicates whether the call leg can become part of a MPTY call initiated by the called subscriber. |
| Call Diversion Treatment Indicator | O | O | O | O | This IE indicates whether the call can be forwarded using the Call Forwarding or Call Deflection Supplementary Services. |
| Calling Party Restriction Indicator | O | - | - | - | This IE indicates whether the CLI shall be marked as Restricted by CAMEL action for the call. |
| ~~Call Completion Treatment Indicator~~ | ~~O~~ | ~~-~~ | ~~-~~ | ~~-~~ | ~~This IE indicates whether the calling user can made a CCBS request for this call. See also 3G TS 23.093 [38] for further details.~~ |

O Optional (Service logic dependent)

- Not applicable

Backward Service Interaction Indicator contains the following information:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| Conference Treatment Indicator | O | O | O | O | This IE indicates if the call leg can become part of a MPTY call initiated by the calling subscriber. |
| Call Completion Treatment Indicator | O | O | O | O | This IE indicates whether a CCBS request can be made for the call. See also ~~Q.1601~~ 3G TS 23.093 [38] for description. |

O  Optional (Service logic dependent)

-  Not applicable

**3GPP TSG CN WG2#8**
**Charleston, South Carolina, USA**
**27-31 March 2000**

*Document* **N2A000329**

*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

## CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

**23.078** CR **132**    Current Version: **3.4.0**

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*        *↑ CR number as allocated by MCC support team*

| For submission to: | CN#8 | for approval | X | | strategic | | *(for SMG* |
|---|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | | non-strategic | | *use only)* |

*Form: CR cover sheet, version 2 for 3GPP and SMG     The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**     (U)SIM [ ]    ME [ ]    UTRAN / Radio [ ]    Core Network [X]
*(at least one should be marked with an X)*

| **Source:** | N2 | | **Date:** | 13.03.2000 |
|---|---|---|---|---|

| **Subject:** | Correction of the CWA SII2 description |
|---|---|

| **Work item:** | CAMEL phase |
|---|---|

**Category:**
*(only one category shall be marked with an X)*

| | | | | **Release:** | |
|---|---|---|---|---|---|
| F | Correction | X | | Phase 2 | |
| A | Corresponds to a correction in an earlier release | | | Release 96 | |
| B | Addition of feature | | | Release 97 | |
| C | Functional modification of feature | | | Release 98 | |
| D | Editorial modification | | | Release 99 | X |
| | | | | Release 00 | |

| **Reason for change:** | The SII2 is also valid in Gateway T-BCSM, even some parameters inside of the SII2 are valid only in VMSC T-BCSM, ref. 4.6.2.6 Connect IF. |
|---|---|

| **Clauses affected:** | |
|---|---|

**Other specs affected:**

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

| **Other comments:** | |
|---|---|

**\*\*\*\* FIRST MODIFIED SECTION \*\*\*\***

## 4.6.2.9 Continue With Argument

### 4.6.2.9.1 Description

This information flow requests the gsmSSF to proceed the call processing with modified information at the DP at which it previously suspended call processing to await gsmSCF instructions. The gsmSSF completes DP processing, and continues basic call processing (i.e., proceeds to the next point in call in the BCSM) with the modified call setup information as received from the gsmSCF.

### 4.6.2.9.2 Information Elements

The following information elements are required:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| Alerting Pattern | - | - | O | O | This parameter indicates the kind of Alerting Pattern to be applied. |
| Calling Partys Category | O | O | O | O | This IE indicates the type of calling party (e.g., operator, pay phone, ordinary subscriber). |
| Generic Number | O | O | O | O | This IE contains the generic number. Its used to convey the additional calling party number, which e.g. could be used to modify the calling line ID presented to the called user. |
| NA Carrier Information | O | O | O | O | This IE is described in the next table. |
| NA Originating Line Information | O | O | O | O | This IE identifies the type of number in the NA Charge Number (e.g. subscriber versus PLMN operator number). |
| NA Charge Number | O | O | O | O | This IE identifies the chargeable number for the usage of a North American carrier. |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Suppression Of Announcements | - | - | O | O | This IE indicates that announcements or tones generated as a result of unsuccessful call setup shall be suppressed. |
| Service Interaction Indicators Two | O | O | O | O | See the Information Flow table of the Connect operation for an explanation of this parameter. ~~For Mobile Terminated calls, this parameter may only be sent to the VMSC.~~ |
| CUG Interlock Code | O | O | O | O | See 3G TS 23.085 [9] for details of this IE. |
| Outgoing Access Indicator | O | O | O | O | See 3G TS 23.085 [9] for details of this IE. |
| Non-CUG Call | O | O | O | O | This IE indicates that no parameters for CUG should be used for the call (i.e. the call should be a non-CUG call). |

O Optional (Service logic dependent)

- Not applicable

Non-CUG Call shall not be present if at least one of CUG Interlock Code and Outgoing Access Indicator are present.

NA Carrier Information contains the following information:

| Information element name | MO | MF | MT | VT | Description |
|---|---|---|---|---|---|
| NA Carrier Identification Code | M | M | M | M | This IE uniquely identifies a North American long distance carrier. |
| NA Carrier Selection Information | M | M | M | M | This IE indicates the way the carrier was selected e.g.:<br>- dialled<br>- subscribed |

M  Mandatory (The IE shall always be sent)

**3GPP/SMG Meeting #?**
**Rotenburg, Germany, 22-26 May 2000**

*Document* **N2-000230**

*e.g. for 3GPP use the format TP-99xxx*
*or for SMG, use the format P-99-xxx*

# CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| **23.078** CR **133r2** | Current Version: | 3.4.0 |
|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*          *↑ CR number as allocated by MCC support team*

| For submission to: | CN#8 | for approval | X | | strategic | | *(for SMG* |
|---|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | | non-strategic | | *use only)* |

*Form: CR cover sheet, version 2 for 3GPP and SMG        The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**
*(at least one should be marked with an X)*

(U)SIM ☐   ME ☐   UTRAN / Radio ☐   Core Network **X**

| **Source:** | N2 | | **Date:** | 30 May 2000 |
|---|---|---|---|---|

| **Subject:** | Improvements on ATM/ATSI/NSDC |
|---|---|

| **Work item:** | CAMEL phase 3 |
|---|---|

**Category:**          F   Correction                                            **X**    **Release:**   Phase 2        ☐
                       A   Corresponds to a correction in an earlier release     ☐                 Release 96     ☐
*(only one category*   B   Addition of feature                                   ☐                 Release 97     ☐
*shall be marked*      C   Functional modification of feature                    ☐                 Release 98     ☐
*with an X)*           D   Editorial modification                                ☐                 Release 99     **X**
                                                                                                    Release 00     ☐

**Reason for change:**

1. Call Forwarding interworking is incomplete. E.g. if SCP interrogates certain CF, and the subscriber has activated different FTN for fax and speech; what shall HLR respond The ATSI-ack can now return the complete set of SS data.

2. If the user uses compound basic service codes when activating CF what shall the NSDC include? This CR proposes that HLR can send compound codes to the SCP.

3. NSDC response is missing from the information flows.

4. It shall be clarified that the SCP is not allowed to withdraw nor make any provisionings of suplementary services.

5. Some information elements are not always applicable when available. E.g. the CFNRy timer is applicable only when the CFNRc is enquired.

6. Stage 2 is aligned with stage 3 (MAP). The CF data and barring data are arrays of 1…32 elements.

| **Clauses affected:** | 10.3.1,  10.3.2. |
|---|---|

**Other specs affected:**

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

| **Other comments:** | |
|---|---|

**\*\*\*\*  FIRST MODIFIED SECTION  \*\*\*\***

## 10.3.1   gsmSCF to HLR information flows

### 10.3.1.1      Any Time Subscription Interrogation Request

#### 10.3.1.1.1         Description

This IF is used to request subscription information from the HLR at any time.

#### 10.3.1.1.2         Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| GsmSCF Address | M | This IE indicates the address of the interrogating gsmSCF. |
| Requested Info | M | This IE indicates the type of subscriber information being requested: This can be one of: <br> - supplementary service, described in a table below <br> - Operator Determined Barring <br> - CAMEL Subscription Information, described in a table below <br> - supported CAMEL phases in VLR <br> - supported CAMEL phases in SGSN |
| Subscriber Identity | M | This IE identifies the subscriber for which the information is requested. The identity can be one of: <br> - IMSI <br> - MSISDN |

M  Mandatory (The IE shall always be sent)

Supplementary service contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS code | M | This IE indicates a supplementary service as defined in 3G TS 22.004 [25]. <br><br> Only the Call Forwarding and Call Barring supplementary services are allowed for this IE. |
| Basic Service | O | See 3G TS 22.002 [24]. |

M  Mandatory (The IE shall always be sent)

O  Optional (Service Logic Dependent)

CAMEL subscription information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| CAMEL subscription information | M | This IE indicates which CAMEL Subscription Information is requested. It may be one of the following elementsw: <br><br> O-CSI/T-CSI/VT-CSI/TIF-CSI/GPRS-CSI/SMS-CSI/SS-CSI/M-CSI/D-CSI |

M  Mandatory (The IE shall always be sent)

### 10.3.1.2    Any Time Modification Request

#### 10.3.1.2.1        Description

This IF is used to modify information in the HLR at any time.

#### 10.3.1.2.2        Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| gsmSCF Address | M | This IE indicates the address of the interrogating gsmSCF. |
| Subscriber Identity | M | This IE identifies the subscriber for which the information is requested. The identity can be one of:<br>-    IMSI<br>-    MSISDN |
| Modification Request for Call Forwarding SS data | C | This IE indicates the data of Call Forwarding data to be modified. It is described in a table below. |
| Modification Request for Call Barring SS data | C | This IE indicates the data of call barring data to be modified. It is described in a table below. |
| Modification Request for CAMEL Subscription Information | C | This IE indicates the Modification Request for CAMEL Subscription Information. It is described in a table below. |

M  Mandatory (The IE shall always be sent)

C  Conditional (The IE shall be sent, if available)

Modification Request for Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | M | This IE indicates Call Forwarding supplementary service as defined in 3G TS 22.004 [25]. |
| Basic Service | O | See 3G TS 22.002 [24]. |
| SS Status | O | See 3G TS 23.011 [26]. Provisioning and withdrawal are not allowed for the gsmSCF. |
| Forwarded-to Number | O | See 3G TS 23.082 [27]. |
| Forwarded-to Subaddress | O | See 3G TS 23.082 [27]. |
| No Reply Condition Time | O | See 3G TS 23.082 [27]. |
| Modify Notification Flag | O | This IE contains an instruction to activate or de-activate the Notification-to-CSE flag. |

M  Mandatory (The IE shall always be sent)

O  Optional (Service Logic dependent)

Modification Request for Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | M | This IE indicates Call Barring supplementary service as defined in 3G TS 22.004 [25]. |
| Basic Service | O | See 3G TS 22.002 [24]. |
| SS Status | O | See 3G TS 23.011 [26]. Provisioning and withdrawal are not allowed for the gsmSCF. |

| | | |
|---|---|---|
| Password | O | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | O | See 3G TS 23.011 [26]. |
| Modify Notification flag | O | This IE contains an instruction to activate or de-activate the Notification-to-CSE flag. |

M  Mandatory (The IE shall always be sent)

O  Optional (Service Logic dependent)

Modification Request for CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | This IE indicates the activation and notification status of the O-CSI. |
| T-CSI | C | This IE indicates the activation and notification status of the T-CSI. |
| VT-CSI | C | This IE indicates the activation and notification status of the TVMSC-CSI. |
| TIF-CSI | C | This IE indicates the activation and notification status of the TIF-CSI. |
| GPRS-CSI | C | This IE indicates the activation and notification status of the GPRS-CSI. |
| SMS-CSI | C | This IE indicates the activation and notification status of the SMS-CSI. |
| SS-CSI | C | This IE indicates the activation and notification status of the SS-CSI. |
| M-CSI | C | This IE indicates the activation and notification status of the M-CSI. |
| Requested CSI | M | This IE indicates which CSI shall be modified.  Only one CSI may be changed in one ATM Request. |
| Modify Notification flag | O | This IE contains an instruction to activate or de-activate the Notification-to-CSE flag. |
| Modify CSI state | O | This IE contains an instruction to activate or de-activate the CSI. |

M  Mandatory (The IE shall always be sent)

O  Optional (Service Logic dependent)

## 10.3.1.3      Notify Subscriber Data Change response

### 10.3.1.3.1      Description

This IF is used by the gsmSCF to respond to the HLR of the change of subscriber data notify.

### 10.3.1.3.2      Information Elements

No information elements.

**\*\*\*\* NEXT MODIFIED SECTION \*\*\*\***

# 10.3.2   HLR to gsmSCF information flows

## 10.3.2.1       Any Time Subscription Interrogation ack

### 10.3.2.1.1         Description

This IF is used by the HLR to provide the requested subscription information to the gsmSCF.

### 10.3.2.1.2         Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| Call Forwarding SS data | C | This IE is described in a table below. |
| Call Bbarring SS data | C | This IE is described in a table belo. |
| Operator Determined Barring data | C | This IE is described in a table belo. |
| CAMEL Subscription Snformation | C | This IE is described in a table belo. |
| Supported CAMEL phases in VLR | C | This IE indicates the CAMEL phase supported in the VLR. |
| Supported CAMEL phases in SGSN | C | This IE indicates the CAMEL phase supported in the SGSN. |

C   Conditional (The IE shall be sent, if requested and available)

Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| Forwarding Feature List | C | See the table below. |
| ~~Basic Service~~ | ~~C~~ | ~~See 3G TS 22.002 [24].~~ |
| ~~SS Status~~ | ~~C~~ | ~~See 3G TS 23.011 [26].~~ |
| ~~Forwarded-to Number~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| ~~Forwarded-to Subaddress~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| ~~Subscription Options~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| ~~No Reply Condition Time~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| Notification-to-CSE Flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Forwarding SS data. |

C   Conditional (The IE shall be sent, if available and applicable)

Forwarding Feature List contains 1 to 32 items of the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |
| Forwarded-to Number | C | See 3G TS 23.082 [27]. |

| Forwarded-to Subaddress | C | See 3G TS 23.082 [27]. |
|---|---|---|
| Subscription Options | C | See 3G TS 23.082 [27]. |
| No Reply Condition Time | C | See 3G TS 23.082 [27]. |

C   Conditional (The IE shall be sent, if available and applicable)

Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| Call Barring Feature List | C | See the table below. |
| ~~Basic Service~~ | ~~C~~ | ~~See 3G TS 22.002 [24].~~ |
| ~~SS Status~~ | ~~C~~ | ~~See 3G TS 23.011 [26].~~ |
| Password | C | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | C | See 3G TS 23.011 [26]. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Barring SS data. |

C   Conditional (The IE shall be sent, if available and applicable)

Call Barring Feature List contains 1 to 32 items of the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |

C   Conditional (The IE shall be sent, if available and applicable)

Operator determined barring data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| ODB General Data | C | This IE indicates the set of subscribers features that the network operator or the service provider can regulate. |
| ODB HPLMN Specific Data | C | This IE indicates the set of subscribers features that the network operator or the service provider can regulate only when the subscriber is registered in the HPLMN. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of ODB data. |

C   Conditional (The IE shall be sent, if available and applicable)

CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | See section 4.3.1. |
| D-CSI | C | See section 4.3.2. |
| T-CSI | C | See section 4.3.4. |
| VT-CSI | C | See section 4.3.5. |
| TIF-CSI | C | See section 4.3.6.2. |
| GPRS-CSI | C | See section 6.3.1. |
| SMS-CSI | C | See section 7.3.1. |

| | | |
|---|---|---|
| SS-CSI | C | See section 8.2.1.1. |
| M-CSI | C | See section 9.2.1.1 |

C   Conditional (The IE shall be sent, if requested and available)

## 10.3.2.2     Any Time Modification ack

### 10.3.2.2.1     Description

This IF is used by the HLR to provide the modified information to the gsmSCF.

### 10.3.2.2.2     Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| Call Forwarding SS data | C | This IE is described in a table below. |
| Call Barring SS data | C | This IE is described in a table below. |
| CAMEL Subscription Information | C | This IE is described in a table below. |

C   Conditional (The IE shall be sent if it was modified)

Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | C | This IE indicates Call Forwarding supplementary service as defined in 3G TS 22.004 [25]. |
| Forwarding Feature List | C | See the table below. |
| ~~Basic Service~~ | ~~C~~ | ~~See 3G TS 22.002 [24].~~ |
| ~~SS Status~~ | ~~C~~ | ~~See 3G TS 23.011 [26].~~ |
| ~~Forwarded-to Number~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| ~~Forwarded-to Subaddress~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| ~~Subscription Options~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| ~~No Reply Condition Time~~ | ~~C~~ | ~~See 3G TS 23.082 [27].~~ |
| Notification-to-CSE Flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Forwarding SS data. |

C   Conditional (The IE shall be sent, if available)

Forwarding Feature List contains 1 to 32 items of the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |
| Forwarded-to Number | C | See 3G TS 23.082 [27]. |
| Forwarded-to Subaddress | C | See 3G TS 23.082 [27]. |
| Subscription Options | C | See 3G TS 23.082 [27]. |
| No Reply Condition Time | C | See 3G TS 23.082 [27]. |

C   Conditional (The IE shall be sent, if available and applicable)

Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | C | This IE indicates **Call Barring** supplementary service as defined in 3G TS 22.004 [25]. |
| Call Barring Feature List | C | See the table below. |
| ~~Basic Service~~ | ~~C~~ | ~~See 3G TS 22.002 [24].~~ |
| ~~SS Status~~ | ~~C~~ | ~~See 3G TS 23.011 [26].~~ |
| Password | C | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | C | See 3G TS 23.011 [26]. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Barring SS data. |

C   Conditional (The IE shall be sent, if available)

Call Barring Feature List contains 1 to 32 items of  the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |

C   Conditional (The IE shall be sent, if available and applicable)


CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | See section 4.3.1. |
| D-CSI | C | See section 4.3.2. |
| T-CSI | C | See section 4.3.4. |
| VT-CSI | C | See section 4.3.5. |
| TIF-CSI | C | See section 4.3.6.2. |
| GPRS-CSI | C | See section 6.3.1. |
| SMS-CSI | C | See section 7.3.1. |
| SS-CSI | C | See section 8.2.1.1. |
| M-CSI | C | See section 9.2.1.1 |

C   Conditional (The IE shall be sent, if it was modified)

## 10.3.2.3     Notify Subscriber Data Change

### 10.3.2.3.1        Description

This IF is used by the HLR to notify to the gsmSCF of the change of subscriber data.

### 10.3.2.3.2        Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| IMSI | M | The IMSI is used to identify the subscriber. |
| MSISDN | M | The MSISDN is used to identify the subscriber. |
| ~~Changed Data~~ | ~~M~~ | ~~This IE identifies the data that has changed. The data can be one of:~~ ~~Call Forwarding SS Data.~~ ~~Call Barring SS Data.~~ ~~Operator Determined Barring~~ ~~CAMEL Susbcription Information~~ |
| Call Forwarding SS data | C | This IE is described in a table below. |
| Call Barring SS data | C | This IE is described in a table below. |
| Operator Determined Barring data | C | This IE is described in a table below. |
| CAMEL Subscription Information | C | This IE is described in a table below. |

M   Mandatory (The IE shall always be sent)

C   Conditional (The IE shall be sent, if  available)

CR editor's note: this CR interworks with NTT Comware tdoc N2a000385 23.078-CR142r1. E.g. Forwarding Feature List and Call Barring Feature Lists are presented in this CR, in NTT tdoc the parameters are on one level up. The differences compared to NTT tdoc are highligted with yellow. These changes shall not appear in yellow in the final approved spec.

Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | C | This IE indicates Call Forwarding supplementary service as defined in 3G TS 22.004 [25]. |
| Forwarding Feature List | C | See the table below. |
| Notification-to-CSE Flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Forwarding SS data. |

C   Conditional (The IE shall be sent, if available)

Forwarding Feature List contains 1 to 32 items of the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. Also compound basic service codes can be used in this operation if the subscriber has used a compound code when modifying the SS (e.g. all bearer services compound code). |
| SS Status | C | See 3G TS 23.011 [26]. |
| Forwarded-to Number | C | See 3G TS 23.082 [27]. |
| Forwarded-to Subaddress | C | See 3G TS 23.082 [27]. |
| Subscription Options | C | See 3G TS 23.082 [27]. |
| No Reply Condition Time | C | See 3G TS 23.082 [27]. |

C   Conditional (The IE shall be sent, if available and applicable)

Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | C | This IE indicates **Call Barring** supplementary service as defined |

| | | in 3G TS 22.004 [25]. |
|---|---|---|
| Call Barring Feature List | C | See the table below. |
| Password | C | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | C | See 3G TS 23.011 [26]. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Barring SS data. |

C   Conditional (The IE shall be sent, if available)

Call Barring Feature List contains 1 to 32 items of the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. Also compound basic service codes can be used in this operation if the subscriber has used a compound code when modifying the SS (e.g. all bearer services compound code). |
| SS Status | C | See 3G TS 23.011 [26]. |

C   Conditional (The IE shall be sent, if available and applicable)

Operator determined barring data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| ODB General Data | C | This IE indicates the set of subscribers features that the network operator or the service provider can regulate. |
| ODB HPLMN Specific Data | C | This IE indicates the set of subscribers features that the network operator or the service provider can regulate only when the subscriber is registered in the HPLMN. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of ODB data. |

C   Conditional (The IE shall be sent, if available and applicable)

CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | See section 4.3.1. |
| D-CSI | C | See section 4.3.2. |
| T-CSI | C | See section 4.3.4. |
| VT-CSI | C | See section 4.3.5. |
| TIF-CSI | C | See section 4.3.6.2. |
| GPRS-CSI | C | See section 6.3.1. |
| SMS-CSI | C | See section 7.3.1. |
| SS-CSI | C | See section 8.2.1.1. |
| M-CSI | C | See section 9.2.1.1 |

C   Conditional (The IE shall be sent, if it was modified)

*N2A000397*
**Document** rev of N2A000339
*e.g. for 3GPP use the format  TP-99xxx*
*or for SMG, use the format  P-99-xxx*

## CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| 23.078 | CR | 138r1 | Current Version: | 3.4.0 |
|---|---|---|---|---|

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*          *↑ CR number as allocated by MCC support team*

For submission to:   CN #08        for approval  **X**        strategic ☐   *(for SMG*
*list expected approval meeting # here ↑*        for information ☐     non-strategic ☐   *use only)*

*Form: CR cover sheet, version 2 for 3GPP and SMG        The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**   (U)SIM ☐   ME ☐   UTRAN / Radio ☐   Core Network **X**
*(at least one should be marked with an X)*

| **Source:** | N2 | | **Date:** | 30.03.2000 |
|---|---|---|---|---|

| **Subject:** | Reception of Int_QoS_Change in the gprsSSF |
|---|---|

| **Work item:** | CAMEL Phase 3 |
|---|---|

**Category:**        F  Correction                                               **X**   **Release:**   Phase 2    ☐
                    A  Corresponds to a correction in an earlier release      ☐            Release 96  ☐
*(only one category*  B  Addition of feature                                    ☐            Release 97  ☐
*shall be marked*    C  Functional modification of feature                     ☐            Release 98  ☐
*with an X)*         D  Editorial modification                                 ☐            Release 99  **X**
                                                                                            Release 00  ☐

**Reason for change:**   Currently Int_QoS_Change can not be received in the gprsSSF process. This contribution gives a proposal for the handling of Int_QoS_Change in the gprsSSF in accordance with 29.078 ApplyChargingReportGPRS procedure.

**Clauses affected:**

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

**Other comments:**

help.doc

<--------- double-click here for help and instructions on how to create a CR.

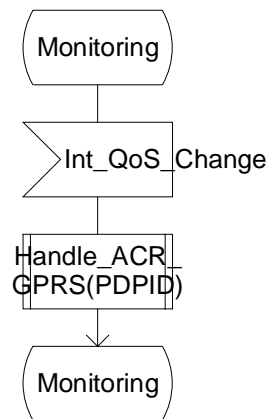| — **First modified section** — |
| :---: |

## 6.5.8 GPRS SSF

Process GPRS_SSF                                                14(14)

/* Process to describe the behaviour of the gprsSSF. */   /* Signals to/from the left are to/from the SGSN; signals to/from the right are to/from the gsmSCF */

Monitoring

Int_QoS_Change

Handle_ACR_
GPRS(PDPID)

Monitoring

**<u>Figure 6.14n: Process GPRS_SSF (sheet 14)</u>**

# CHANGE REQUEST

*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **23.078** | **CR** | **141** | | Current Version: | | **3.4.0** | |

*GSM (AA.BB) or 3G (AA.BBB) specification number ↑*          *↑ CR number as allocated by MCC support team*

| For submission to: | CN#8 | for approval | X | strategic | | *(for SMG* |
|---|---|---|---|---|---|---|
| *list expected approval meeting # here ↑* | | for information | | non-strategic | | *use only)* |

*Form: CR cover sheet, version 2 for 3GPP and SMG      The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

**Proposed change affects:**           (U)SIM [ ]     ME [ ]     UTRAN / Radio [ ]     Core Network [X]
*(at least one should be marked with an X)*

| | | | | |
|---|---|---|---|---|
| **Source:** | N2 | | **Date:** | 24/03/00 |

| | |
|---|---|
| **Subject:** | Correction on chapter 10 |

| | |
|---|---|
| **Work item:** | CAMEL Phase 3 |

**Category:**   F   Correction   [X]          **Release:**   Phase 2   [ ]
            A   Corresponds to a correction in an earlier release   [ ]       Release 96   [ ]
*(only one category*   B   Addition of feature   [ ]       Release 97   [ ]
*shall be marked*   C   Functional modification of feature   [ ]       Release 98   [ ]
*with an X)*   D   Editorial modification   [ ]       Release 99   [X]
                        Release 00   [ ]

| **Reason for change:** | - spelling miss correction<br><br>- reference number correction |
|---|---|

| **Clauses affected:** | 10 |
|---|---|

| **Other specs affected:** | Other 3G core specifications | [ ] | → List of CRs: | |
|---|---|---|---|---|
| | Other GSM core specifications | [ ] | → List of CRs: | |
| | MS test specifications | [ ] | → List of CRs: | |
| | BSS test specifications | [ ] | → List of CRs: | |
| | O&M specifications | [ ] | → List of CRs: | |

| **Other comments:** | |
|---|---|

help.doc

<--------- double-click here for help and instructions on how to create a CR.

# 10 Control and interrogation of subscription data

## 10.1 Architecture

### 10.1.1 Functional Entities used for CAMEL

This subclause describes the functional architecture required to support control and interrogation of subscription data. Figure 10.1 shows the functional entities involved in CAMEL support of control and interrogation of subscription data.

**Home Network**

HLR $\longleftarrow$ MAP $\longrightarrow$ gsmSCF
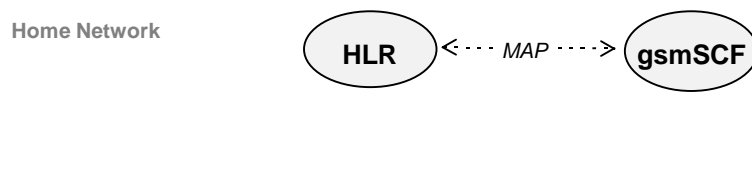
**Figure 10.1: Functional architecture for support of control and interrogation of subscription data**

**gsmSCF: see subclause 4.1.**

**HLR:** The HLR may provide an interface to the gsmSCF for the Any Time Subscription Interrogation and Any Time Modification procedures. The gsmSCF may provide an interface to the HLR for the Notify Subscriber Data Change procedure.

### 10.1.2 Interfaces defined for CAMEL

This subclause describes the interface applicable to CAMEL control of subscription data. It specifies on a high level the functions specific to CAMEL.

#### 10.1.2.1 gsmSCF - HLR

This interface is used by the gsmSCF to interrogate or modify information in the HLR. As a network operator option, the HLR may refuse to provide or modify the information requested by the gsmSCF. This interface is also used by the HLR to notify the gsmSCF of a change of subscriber data.

## 10.2 Procedures for CAMEL

### 10.2.1 Any Time Subscription Interrogation

Handling of Any Time Interrogation for Subscription Information Retrieval involves the following process:

- CAMEL_ATSI_HLR.

If an OSS needs the Subscription Information, the gsmSCF initiates a transaction to the HLR by sending an Any Time Subscription Interrogation Request. Support for this procedure is a network operator option.

**Process CAMEL_ATSI_HLR** 1(1)

Process in the HLR receiving an Any Time Subscription Interrogation request from gsmSCF

Signals to/from the left are to/from the gsmSCF

Idle

Any Time Subscription Interrogation Request

Requested interrogation is valid? (refer to 3G TS 23.011, 23.082 and 23.088)

ATI accepted?

No

Yes

MS known?

No

Yes

Requested data

SS data

CSI
Supported CAMEL phases
ODB data

Set UE= "Unknown subscriber"

Set UE= "ATSI Not Allowed"

Requested data available?

No

Requested SS is CF or CB?

No

Yes

Yes

Yes

No

Set UE= "Unexpected Data Value"

Set requested data to return result

Set UE= "Not available"

Set UE according to 3G TS 23.011, 23.082 and 23.088

Any Time Subscription Interrogation ack

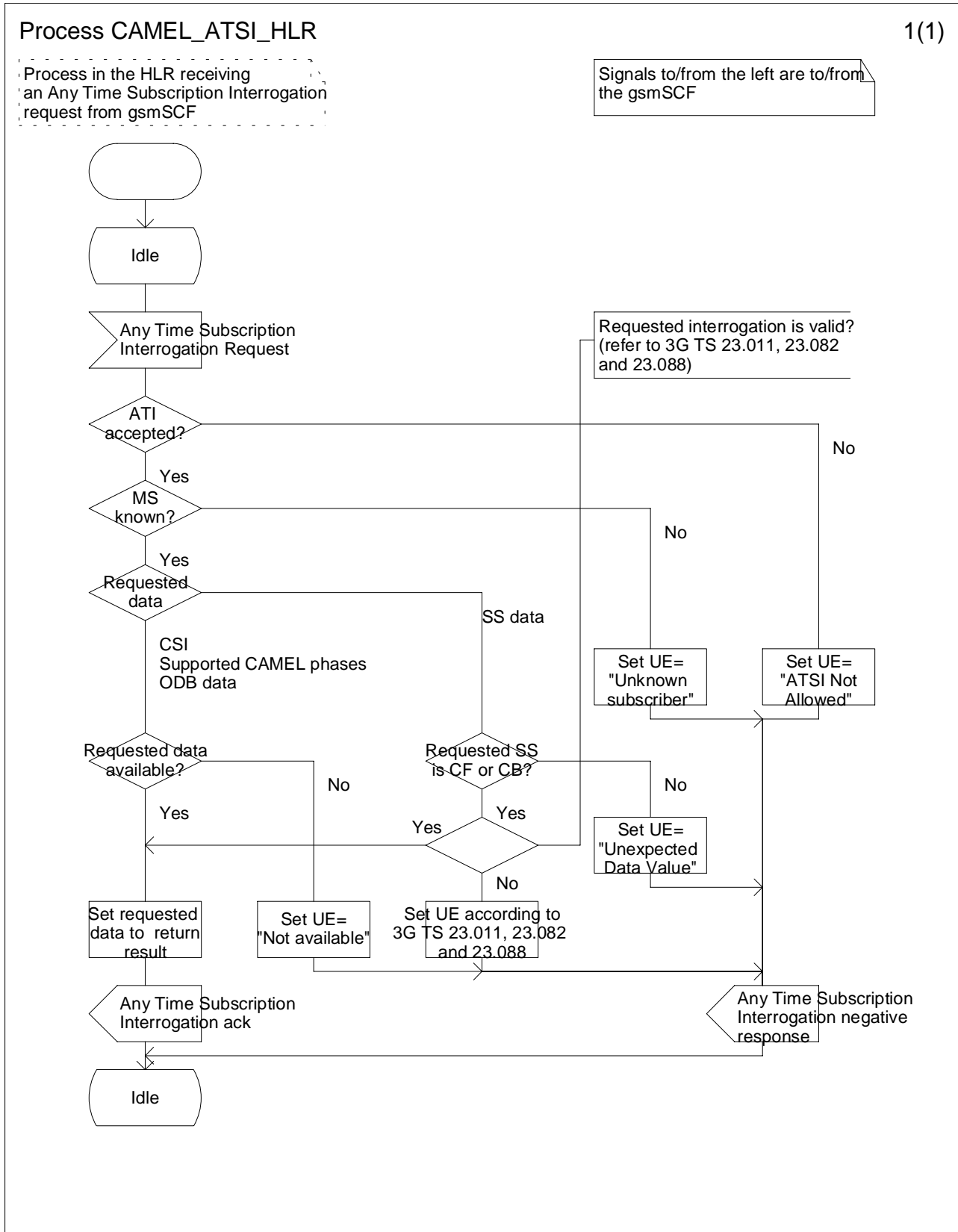Any Time Subscription Interrogation negative response

Idle

**Figure 10.2: Process CAMEL_ATSI_HLR (sheet 1)**

## 10.2.2 Any Time Modification

Handling of Any Time Modification involves the following process:

- CAMEL_ATM_HLR.

The following procedures are involved:

- ATM_Modify_Data
  This procedure checks which data shall be modified and calls the appropriate data modification procedure.

- ATM_Modify_CSI_Data
  If the CSI indicated in the ATM request is not available in the HLR, then an error is returned.
  Otherwise, the CSI state and/or Notification-to-CSE flag are set as instructed with the ATM request.

- ATM_Modify_CF_Data
  When only the SS-code and (optionally) a Basic Service code are present in the ATM request, then all Call Forwarding data is erased.
  Otherwise, the behaviour is as follows:

  - If a valid SS state is present in the ATM request, then an SS state transition is performed

  - If a valid FTN, FTN sub address or No Reply Condition Time is present in the ATM request, then the indicated variable is modified.

  - If an instruction to modifiy the notification-to-CSE flag is present in the ATM request, then the notification-to-CSE flag is modified.

- ATM_Modify_CB_Data
  When only the SS-code and (optionally) a Basic Service code are present in the ATM request, then all Call Barring data is erased.
  Otherwise, the behaviour is as follows:

  - If a valid SS state is present in the ATM request, then an SS state transition is performed

  - If a valid Password or 'Wrong password attempt counter' is present in the ATM request, then the indicated variable is modified.

  - If an instruction to modifiy the notification-to-CSE flag is present in the ATM request, then the notification-to-CSE flag is modified.

After having executed the Any Time Modification instruction from the gsmSCF, the HLR calls the procedure CAMEL_NSDC_HLR, which sends notifications to gsmSCF(s), if required.

Support for this procedure is a network operator option.

Process CAMEL_ATM_HLR 1(1)

Process in the HLR receiving
an Any Time Subscription Modification
request from gsmSCF

Signals to/from the left are to/from
the gsmSCF, unless otherwise indicated.

Idle

Any Time
Modification
request

ATM
accepted?

No

Yes

MS
known?

No

Yes

Requested data
available?

No

Yes

ATM_Modify_
Data

Set UE=
"Not available"

Set UE=
"Unknown
subscriber"

Set UE=
"ATM Not
Allowed"

Result?

Fail

Pass

Set Result to
modified data

Any Time
Modification
ack

Any Time
Modification
Error

CAMEL_NSDC_
HLR

Idle
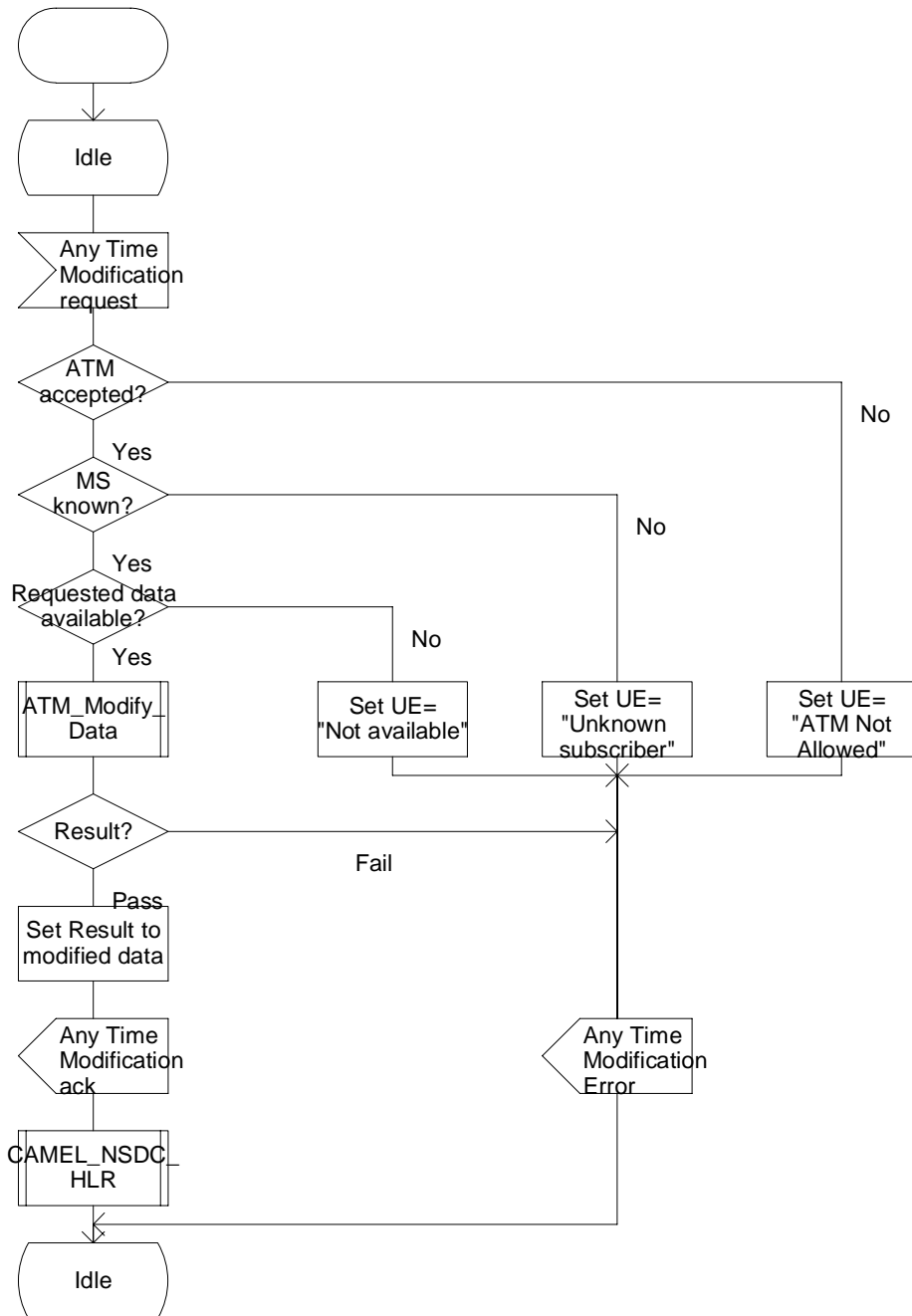
**Figure 10.3: Process CAMEL_ATM_HLR (sheet 1)**

*3GPP*

Procedure ATM_Modify_Data                                                    1(1)

Procedure in the HLR to modify subscriber
data as a result of an ATM request

Data to be
modified

CSI                              CF Data                              CB Data

ATM_Modify_          ATM_Modify_          ATM_Modify_
CSI_Data            CF_Data              CB_Data

Result?  Not OK     Result?  Not OK      Result?  Not OK

OK                  OK                   OK

Set UE=             Set UE in accordance     Set UE in accordance
"InformationNotAvailable"    with 3G TS 23.011 and 23.082    with 3G TS 23.011 and 23.088

Set Result=                              Set Result=
"Pass"                                   "Fail"
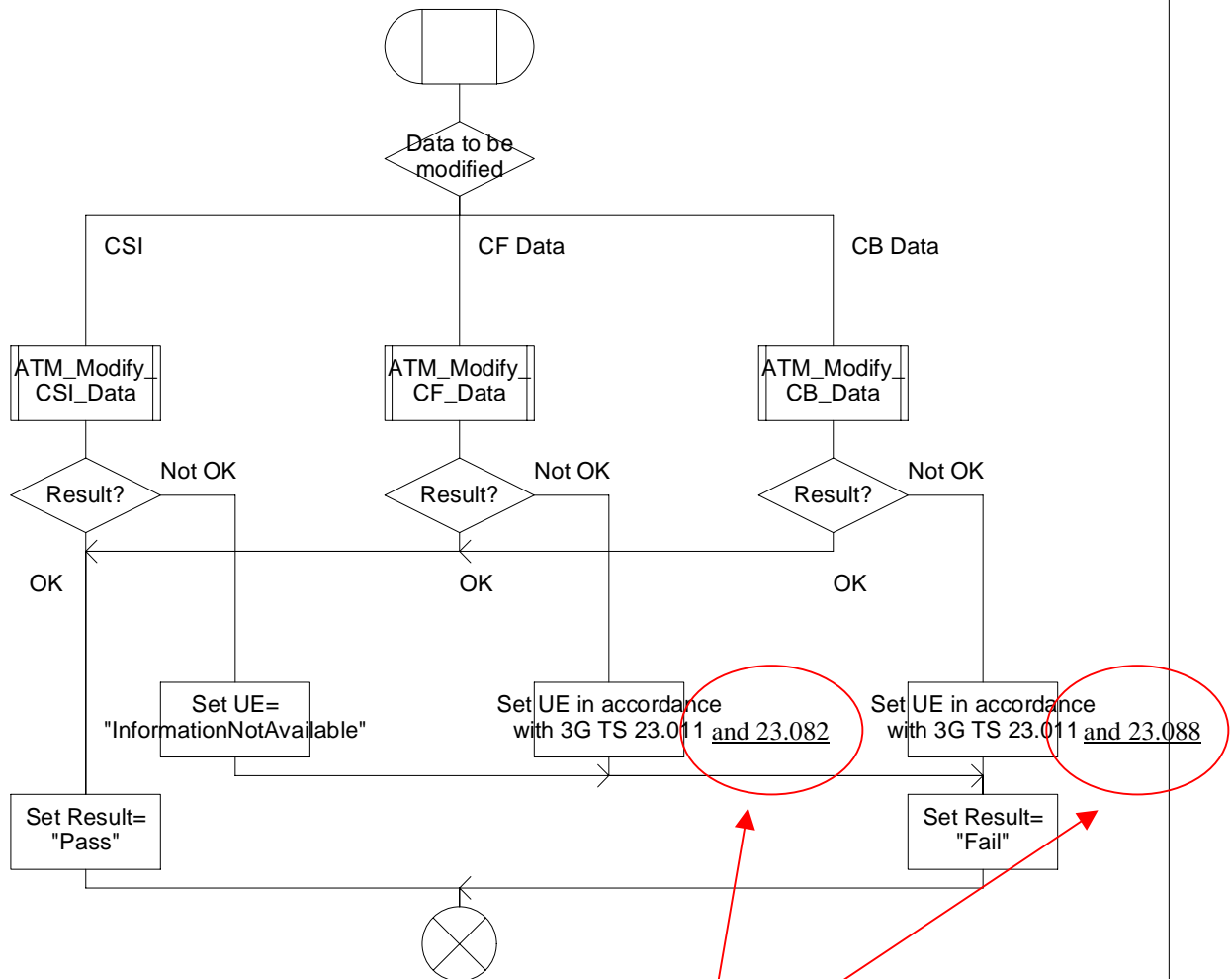
Added

**Figure 10.4: Procedure ATM_Modify_Data (sheet 1)**

Procedure ATM_Modify_CSI_Data 1(1)

Procedure in the HLR to modify CSI data
as a result of an ATM request.

No ◇ Requested CSI
available in HLR?

Yes

No ◇ Modify CSI state
requested?

Yes

Modify CSI
state

No ◇ Modify notification
flag requested?

Yes

Modify
notification flag

Set Result=
"Not OK"

Set Result=
"OK"

⊗

**Figure 10.5: Procedure ATM_Modify_CSI_Data (sheet 1)**

Procedure ATM_Modify_CF_Data 1(1)

Procedure in the HLR to modify  Call
Forwarding data, as a result of an
ATM request.

Note 1
When ATM contains 'BasicService', then the changes
to CF apply to that BasicService only.
When ATM does not contains 'BasicService',
then the changes to CF apply to all BasicService.

Note 2
Changes to Call Forwarding data shall be done
in accordance with 3G TS 23.082 and 3G TS 23.011.

Yes — Only SS-code and
(optionally) Basic Service
present in ATM?

Erase Call
Forwarding
Data

No — No — SS-status present in ATM?

Set Result=
"OK"

No — Yes — Requested CF state transition valid?
(refer 3G TS 23.082 and 3G TS 23.011)

Yes

Set Call
Forwarding
state

No — FTN, FTN sub address or
No Reply Condition Time
present in ATM?

Yes

No — Requested FTN, FTN sub address or
No Reply Condition Time valid?
(refer 3G TS 23.082 and 3G TS 23.011)

Yes — Set FTN, FTN sub address or
No Reply Condition Time

No — Notification flag instruction
present in ATM?

Yes

Set notification-
to-CSE flag
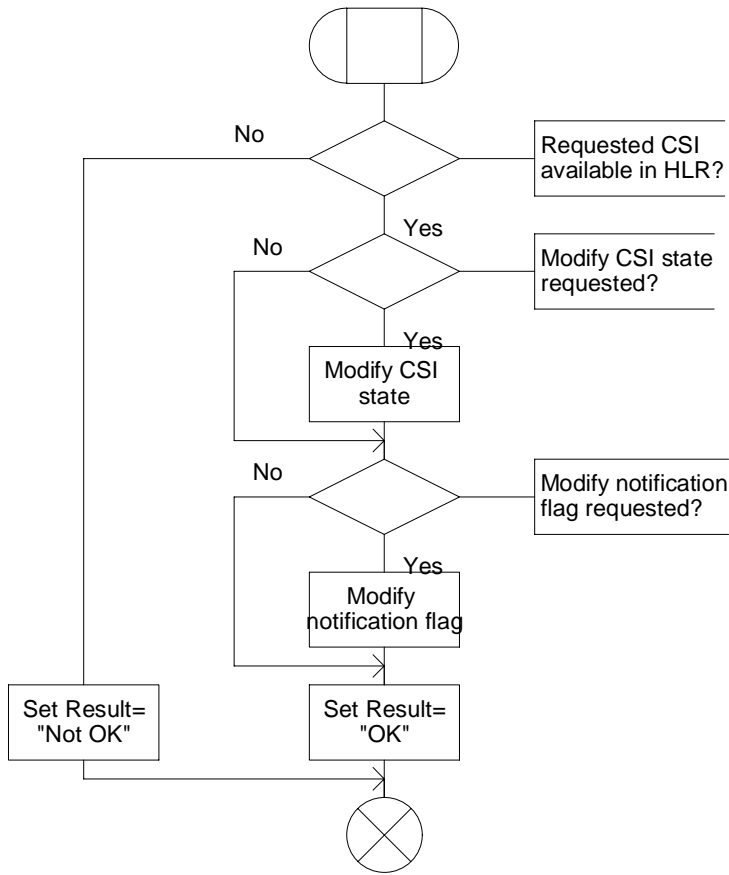
Set Result=
"Not OK"

Set Result=
"OK"

**Figure 10.6: Procedure ATM_Modify_CF_Data (sheet 1)**

Procedure ATM_Modify_CB_Data 1(1)

Procedure in the HLR to modify Call Barring data, as a result of an ATM request.

Note 1
When ATM contains 'BasicService', then the changes to CB apply to that BasicService only.
When ATM does not contains 'BasicService', then the changes to CB apply to all BasicService.

Note 2
Changes to Call Barring data shall be done in accordance with 3G TS 23.088 and 3G TS 23.011.

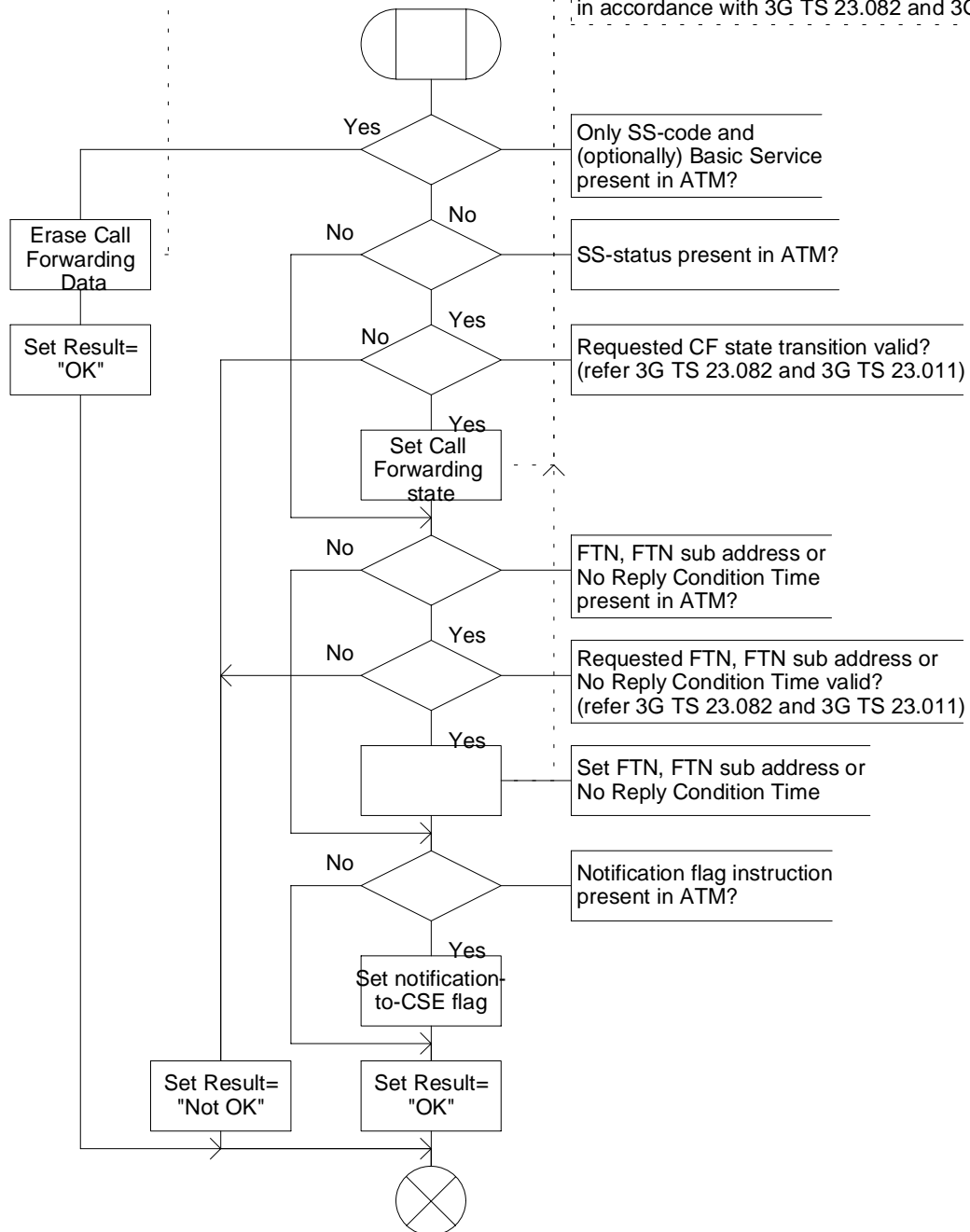Yes — Only SS-code and (optionally) Basic Service present in ATM?

Erase Call Barring Data

Set Result= "OK"

No — SS-status present in ATM?

No — Yes — Requested CB state transition valid? (refer 3G TS 23.088 and 3G TS 23.011)

Set Call Barring status

No — Password or 'wrong password attempt counter' present in ATM?

No — Yes — Password or 'wrong password attempt counter' valid? (refer 3G TS 23.082 and 3G TS 23.011)

23.088

Yes — Set Password or 'wrong password attempt counter'

*Changed*

No — Notification flag instruction present in ATM?

Yes — Set notification-to-CSE flag
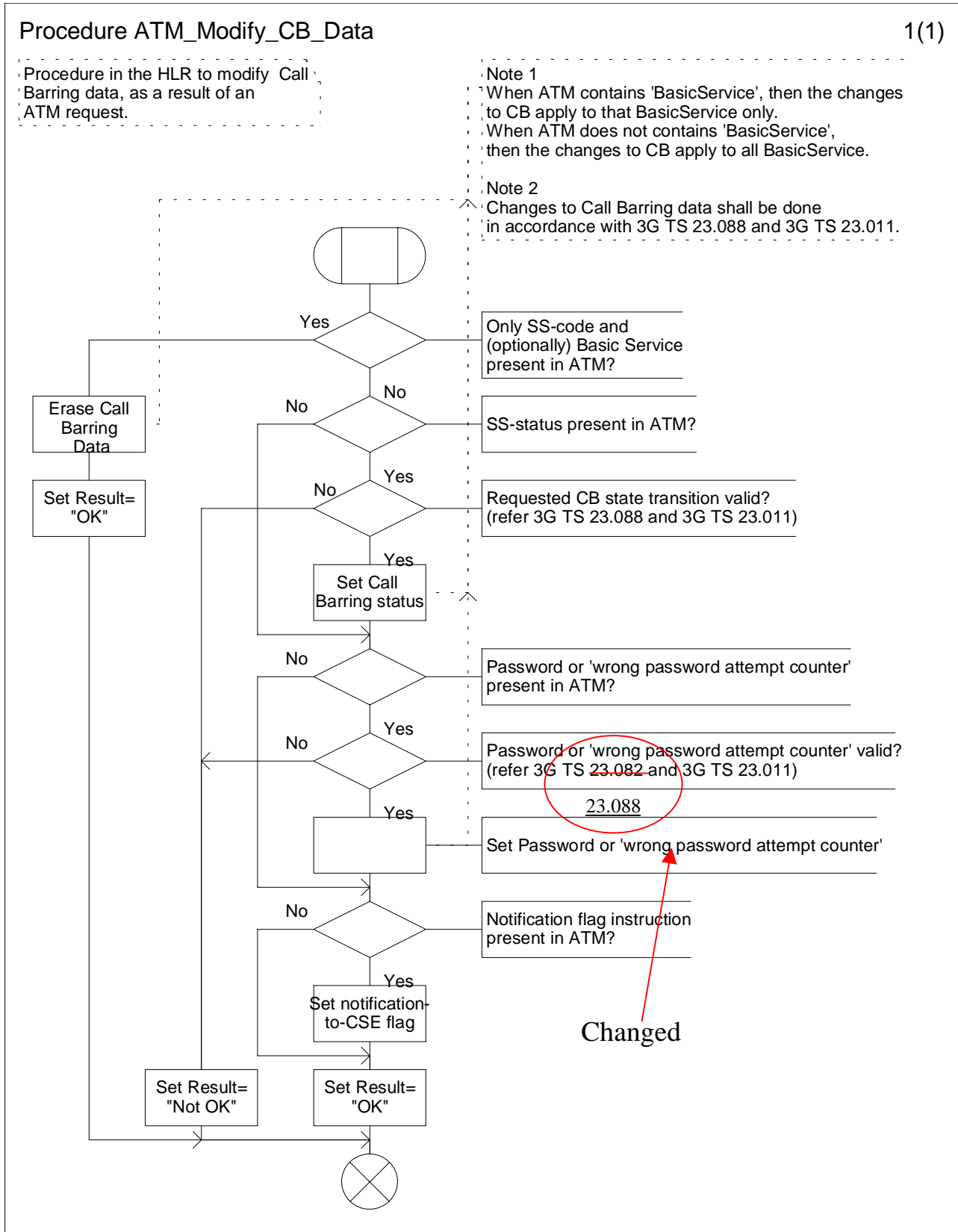
Set Result= "Not OK"

Set Result= "OK"

**Figure 10.7: Procedure ATM_Modify_CB_Data (sheet 1)**

## 10.2.3    Notify Subscriber Data Change

Changes of CSI, Call Forwarding data, Call Barring data or ODB data shall be notified only if the CSI, Call Forwarding data, Call Barring data or ODB data is marked with the Notification-to-CSE flag.

The HLR maintains a list of gsmSCF address(es) for Call Forwarding Data, Call Barring Data, ODB and CSI. When any of these items has been modified, a notification shall be sent to each gsmSCF in the corresponding list.

The sending of a notification to the gsmSCF may be triggered by the following processes:

- subscriber data change by administrative procedure

- subscriber data changed by subscriber

- subscriber data changed by Any Time Modification request from gsmSCF

- subscriber data changed due to a change of other subscriber data

- subscriber data change due to Location Update

When the change of subscriber data was requested by Any Time Modification the notification of change of subscriber data shall not be sent to the gsmSCF which originated this Any Time Modification request.

Each gsmSCF shall be notified only once. Multiple occurrence of gsmSCF Address in these lists shall not lead to multiple notification.

Handling of Notify Subscriber Data Change involves the following procedure:

- CAMEL_NSDC_HLR.

If a change of subscriber data needs to be notified to the gsmSCF, then the HLR initiates a transaction to the gsmSCF by sending Notify Subscriber Data Change message.

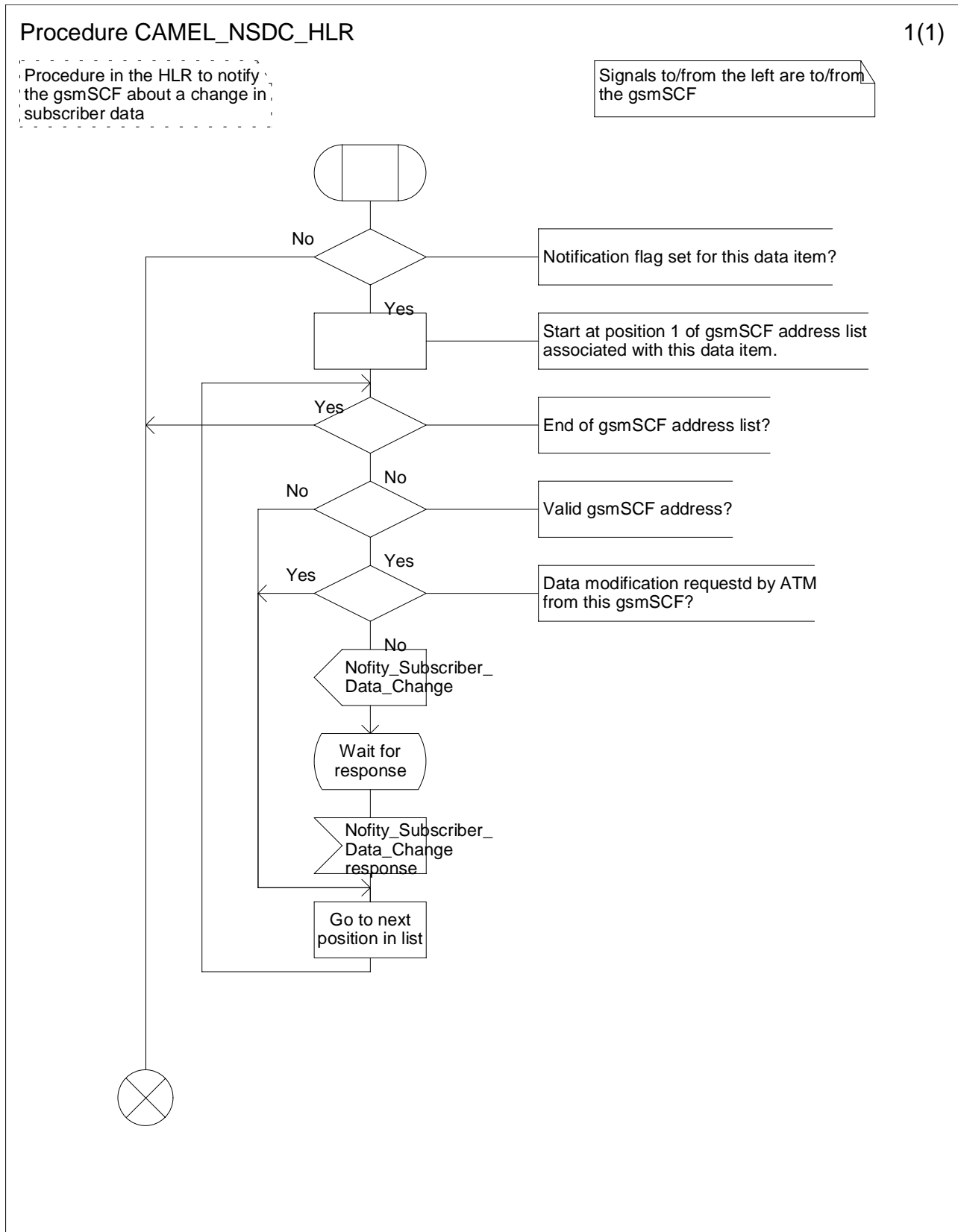Support for this procedure is a network operator option.

Procedure CAMEL_NSDC_HLR 1(1)

Procedure in the HLR to notify the gsmSCF about a change in subscriber data

Signals to/from the left are to/from the gsmSCF

Notification flag set for this data item?

Start at position 1 of gsmSCF address list associated with this data item.

End of gsmSCF address list?

Valid gsmSCF address?

Data modification requestd by ATM from this gsmSCF?

Nofity_Subscriber_Data_Change

Wait for response

Nofity_Subscriber_Data_Change response

Go to next position in list

**Figure 10.8: Procedure CAMEL_NSDC_HLR (sheet1)**

# 10.3 Description of information flows

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

Each Information Element, IE is marked as Mandatory (M), Conditional (C), Optional (O) or Not applicable (-). This categorisation is a functional classification, i.e. stage 2 information and not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support

- The HLR shall return an error if it does not functionally support an IE which it receives.

Details of errors and exceptions to these rules are specified in 3G TS 29.002 [4].

## 10.3.1 gsmSCF to HLR information flows

### 10.3.1.1 Any Time Subscription Interrogation Request

#### 10.3.1.1.1 Description

This IF is used to request subscription information from the HLR at any time.

#### 10.3.1.1.2 Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| GsmSCF Address | M | This IE indicates the address of the interrogating gsmSCF. |
| Requested Info | M | This IE indicates the type of subscriber information being requested: This can be one of:<br><br>- supplementary service, described in a table below<br><br>- Operator Determined Barring<br><br>- CAMEL Subscription Information, described in a table below<br><br>- supported CAMEL phases in VLR<br><br>- supported CAMEL phases in SGSN |
| Subscriber Identity | M | This IE identifies the subscriber for which the information is requested. The identity can be one of:<br><br>- IMSI<br><br>- MSISDN |

M  Mandatory (The IE shall always be sent)

Supplementary service contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS code | M | This IE indicates a supplementary service as defined in 3G TS 22.004 [25].<br><br>Only the Call Forwarding and Call Barring supplementary services are allowed for this IE. |
| Basic Service | O | See 3G TS 22.002 [24]. |

M  Mandatory (The IE shall always be sent)

O  Optional (Service Logic Dependent)

CAMEL subscription information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| CAMEL subscription information | M | This IE indicates which CAMEL Subscription Information is requested. It may be one of the following elementsw:<br><br>O-CSI/T-CSI/VT-CSI/TIF-CSI/GPRS-CSI/SMS-CSI/SS-CSI/M-CSI/D-CSI |

M  Mandatory (The IE shall always be sent)

### 10.3.1.2 Any Time Modification Request

#### 10.3.1.2.1 Description

This IF is used to modify information in the HLR at any time.

#### 10.3.1.2.2 Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| gsmSCF Address | M | This IE indicates the address of the interrogating gsmSCF. |
| Subscriber Identity | M | This IE identifies the subscriber for which the information is requested. The identity can be one of:<br><br>- IMSI<br><br>- MSISDN |
| Modification Request for Call Forwarding SS data | C | This IE indicates the data of Call Forwarding data to be modified. It is described in a table below. |
| Modification Request for Call Barring SS data | C | This IE indicates the data of call barring data to be modified. It is described in a table below. |
| Modification Request for CAMEL Subscription Information | C | This IE indicates the Modification Request for CAMEL Subscription Information. It is described in a table below. |

M  Mandatory (The IE shall always be sent)

C  Conditional (The IE shall be sent, if available)

Modification Request for Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | M | This IE indicates Call Forwarding supplementary service as defined in 3G TS 22.004 [25]. |
| Basic Service | O | See 3G TS 22.002 [24]. |
| SS Status | O | See 3G TS 23.011 [26]. |
| Forwarded-to Number | O | See 3G TS 23.082 [27]. |
| Forwarded-to Subaddress | O | See 3G TS 23.082 [27]. |
| No Reply Condition Time | O | See 3G TS 23.082 [27]. |
| Modify Notification Flag | O | This IE contains an instruction to activate or de-activate the Notification-to-CSE flag. |

M  Mandatory (The IE shall always be sent)

O  Optional (Service Logic dependent)

Modification Request for Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | M | This IE indicates Call Barring supplementary service as defined in 3G TS 22.004 [25]. |
| Basic Service | O | See 3G TS 22.002 [24]. |
| SS Status | O | See 3G TS 23.011 [26]. |
| Password | O | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | O | See 3G TS 23.011 [26]. |
| Modify Notification flag | O | This IE contains an instruction to activate or de-activate the Notification-to-CSE flag. |

M Mandatory (The IE shall always be sent)

O Optional (Service Logic dependent)

Modification Request for CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| ~~O-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the O-CSI.~~ |
| ~~T-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the T-CSI.~~ |
| ~~VT-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the TVMSC-CSI.~~ |
| ~~TIF-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the TIF-CSI.~~ |
| ~~GPRS-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the GPRS-CSI.~~ |
| ~~SMS-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the SMS-CSI.~~ |
| ~~SS-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the SS-CSI.~~ |
| ~~M-CSI~~ | ~~C~~ | ~~This IE indicates the activation and notification status of the M-CSI.~~ |
| Requested CSI | M | This IE indicates which CSI shall be modified. Only one CSI may be changed in one ATM Request. |
| Modify Notification flag | O | This IE contains an instruction to activate or de-activate the Notification-to-CSE flag. |
| Modify CSI state | O | This IE contains an instruction to activate or de-activate the CSI. |

M Mandatory (The IE shall always be sent)

O Optional (Service Logic dependent)

## 10.3.2 HLR to gsmSCF information flows

### 10.3.2.1 Any Time Subscription Interrogation ack

#### 10.3.2.1.1 Description

This IF is used by the HLR to provide the requested subscription information to the gsmSCF.

#### 10.3.2.1.2 Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| Call Forwarding SS data | C | This IE is described in a table below. |
| Call Bbarring SS data | C | This IE is described in a table below. |
| Operator Determined Barring data | C | This IE is described in a table below. |
| CAMEL Subscription SInformation | C | This IE is described in a table below. |
| Supported CAMEL phases in VLR | C | This IE indicates the CAMEL phase supported in the VLR. |
| Supported CAMEL phases in SGSN | C | This IE indicates the CAMEL phase supported in the SGSN. |

C Conditional (The IE shall be sent, if requested and available)

Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |
| Forwarded-to Number | C | See 3G TS 23.082 [27]. |
| Forwarded-to Subaddress | C | See 3G TS 23.082 [27]. |
| Subscription Options | C | See 3G TS 23.082 [27]. |
| No Reply Condition Time | C | See 3G TS 23.082 [27]. |
| Notification-to-CSE Flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Forwarding SS data. |

C Conditional (The IE shall be sent, if available)

Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |
| Password | C | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | C | See 3G TS 23.011 [26]. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Barring SS data. |

C Conditional (The IE shall be sent, if available)

Operator determined barring data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| ODB General Data | C | This IE indicates the set of subscribers features that the network operator or the service provider can regulate. |
| ODB HPLMN Specific Data | C | This IE indicates the set of subscribers features that the network operator or the service provider can regulate only when the subscriber is registered in the HPLMN. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of ODB data. |

C Conditional (The IE shall be sent, if available)

CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | See section 4.3.1. |
| D-CSI | C | See section 4.3.2. |
| T-CSI | C | See section 4.3.4. |
| VT-CSI | C | See section 4.3.5. |
| TIF-CSI | C | See section 4.3.6.2. |
| GPRS-CSI | C | See section 6.3.1. |
| SMS-CSI | C | See section 7.3.1. |
| SS-CSI | C | See section 8.2.1.1. |
| M-CSI | C | See section 9.2.1.1 |

C Conditional (The IE shall be sent, if requested and available)

## 10.3.2.2 Any Time Modification ack

### 10.3.2.2.1 Description

This IF is used by the HLR to provide the modified information to the gsmSCF.

### 10.3.2.2.2 Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| Call Forwarding SS data | C | This IE is described in a table below. |
| Call Barring SS data | C | This IE is described in a table below. |
| CAMEL Subscription Information | C | This IE is described in a table below. |

C Conditional (The IE shall be sent if it was modified)

Call Forwarding SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | C | This IE indicates Call Forwarding supplementary service as defined in 3G TS 22.004 [25]. |
| Basic Service | C | See 3G TS 22.002 [24]. |

| SS Status | C | See 3G TS 23.011 [26]. |
|---|---|---|
| Forwarded-to Number | C | See 3G TS 23.082 [27]. |
| Forwarded-to Subaddress | C | See 3G TS 23.082 [27]. |
| Subscription Options | C | See 3G TS 23.082 [27]. |
| No Reply Condition Time | C | See 3G TS 23.082 [27]. |
| Notification-to-CSE Flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Forwarding SS data. |

C   Conditional (The IE shall be sent, if available)

Call Barring SS data contains the following information:

| Information element name | Required | Description |
|---|---|---|
| SS Code | C | This IE indicates Call Barring supplementary service as defined in 3G TS 22.004 [25]. |
| Basic Service | C | See 3G TS 22.002 [24]. |
| SS Status | C | See 3G TS 23.011 [26]. |
| Password | C | See 3G TS 23.011 [26]. |
| Wrong password attempts counter | C | See 3G TS 23.011 [26]. |
| Notification-to-CSE flag | C | This IE indicates whether the gsmSCF is notified of a change of Call Barring SS data. |

C   Conditional (The IE shall be sent, if available)

CAMEL Subscription Information contains the following information:

| Information element name | Required | Description |
|---|---|---|
| O-CSI | C | See section 4.3.1. |
| D-CSI | C | See section 4.3.2. |
| T-CSI | C | See section 4.3.4. |
| VT-CSI | C | See section 4.3.5. |
| TIF-CSI | C | See section 4.3.6.2. |
| GPRS-CSI | C | See section 6.3.1. |
| SMS-CSI | C | See section 7.3.1. |
| SS-CSI | C | See section 8.2.1.1. |
| M-CSI | C | See section 9.2.1.1 |

C   Conditional (The IE shall be sent, if it was modified)

### 10.3.2.3    Notify Subscriber Data Change

#### 10.3.2.3.1    Description

This IF is used by the HLR to notify to the gsmSCF of the change of subscriber data.

#### 10.3.2.3.2    Information Elements

The following information elements are required:

| Information element name | Required | Description |
|---|---|---|
| IMSI | M | The IMSI is used to identify the subscriber. |
| MSISDN | M | The MSISDN is used to identify the subscriber. |
| Changed Data | M | This IE identifies the data that has changed. The data can be one of:<br><br>- Call Forwarding SS Data<br><br>- Call Barring SS Data<br><br>- Operator Determined Barring<br><br>- CAMEL Susbscription Information |

M  Mandatory (The IE shall always be sent)