

**3GPP TSG CN Plenary Meeting #17**  
**4<sup>th</sup> - 6<sup>th</sup> September 2002. Biarritz, France.**

**NP-020345**

**Source:** TSG CN WG2  
**Title:** CRs on Rel-5 Work Item CAMEL4, CR Pack 5  
**Agenda item:** 8.3  
**Document for:** APPROVAL

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**Introduction:**

This document contains 3 CRs on Rel-5 WI CAMEL4. These CRs have been agreed by TSG CN WG2 and are forwarded to TSG CN Plenary meeting #17 for approval.

<b>Spec</b>	<b>CR</b>	<b>Rev</b>	<b>Doc-2nd-Level</b>	<b>Phase</b>	<b>Subject</b>	<b>Cat</b>	<b>Ver_C</b>
23.078	417		N2-020663	Rel-5	Removal of ChargingNotification feature	C	5.0.0
29.078	259		N2-020665	Rel-5	Removal of ChargingNotification feature	C	5.0.0
23.078	420	1	N2-020785	Rel-5	Cleanup of the LocationInformation table for the call accepted DP	D	5.0.0

3GPP TSG CN WG2 Meeting #25  
 Helsinki, Finland, 29<sup>th</sup> July – 2<sup>nd</sup> August 2002

N2-020663

CR-Form-v7
<b>CHANGE REQUEST</b>
⌘ <b>23.078 CR 417</b> ⌘ rev <b>-</b> ⌘ Current version: <b>5.0.0</b> ⌘

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

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

<b>Title:</b>	⌘ Removal of ChargingNotification feature		
<b>Source:</b>	⌘ Alcatel		
<b>Work item code:</b>	⌘ CAMEL4	<b>Date:</b>	⌘ 27/06/2002
<b>Category:</b>	⌘ <b>C</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ Stage 1 has removed the " Charging Notification procedure". This needs to be reflected in the CAMEL stage 2 and stage 3 as well.
<b>Summary of change:</b>	⌘ Removal of ChargingNotification feature
<b>Consequences if not approved:</b>	⌘ Inconsistent set of CAMEL Phase 4 specifications.

<b>Clauses affected:</b>	⌘ 1, 1.1, 1.1.1, 1.1.2, 4.5.2.1.11, 4.5.3.1.12, 4.5.4.1.4, 4.5.5.6, 4.5.6.2.1, 4.5.7.4, 4.5.7.6, 4.5.13, 4.6.1.6, 4.6.2.19										
<b>Other specs affected:</b>	<table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ Rel-5 29.078-CR259, Rel-5 29.002-CR480
Y	N										
X											
	X										
	X										
<b>Other comments:</b>	⌘										

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— **First modified section** —

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## 1 Scope

The present document specifies the stage 2 description for the fourth phase (see 3GPP TS 22.078 [6]) of the Customized Applications for Mobile network Enhanced Logic (CAMEL) feature which provides the mechanisms to support services of operators which are not covered by standardized services even when roaming outside the HPLMN.

The CAMEL feature is a network feature and not a supplementary service. It is a tool to help the network operator to provide the subscribers with the operator specific services even when roaming outside the HPLMN.

In the present document, the GSM Service Control Function (gsmSCF) is treated as being part of the HPLMN. The regulatory environment in some countries may require the possibility that the gsmSCF and the HPLMN are controlled by different operators, and the gsmSCF and the HPLMN are therefore distinct entities.

The fourth phase of the CAMEL feature supports, in addition to the third phase of the CAMEL:

- Interactions with Optimal Routing;
- Call Party Handling;
- DTMF Mid call procedure for Mobile Originated and Mobile Terminating calls;
- Inclusion of flexible tone injection;
- ~~Charging Notification to CSE;~~
- Provision of location information of called subscriber;
- Provide location information during ongoing call;
- CAMEL control over MT SMS;
- Notification of GPRS mobility management to CSE;
- Inclusion of ODB data in Any Time Modification;
- Enhancement of Any Time Interrogation and Provide Subscriber Information for PS Domain.

CAMEL applicability to IP-based multimedia services is introduced in the fourth phase of the CAMEL. It is specified in 3GPP TS 23.278 [27].

CAMEL is not applicable to Emergency Setup (TS 12), i.e., if an Emergency call is requested, then the gsmSSF shall not be invoked.

The mechanism described in the present document addresses especially the need for information exchange between the VPLMN or IPLMN and the HPLMN for support of operator specific services. Any user procedures for the control of operator specific services are outside the scope of the present document. Subscribers who have subscribed to operator specific services and therefore need the functional support of the CAMEL feature shall be marked in the HPLMN and VPLMN. In case a subscriber is marked to need CAMEL support, the appropriate procedures which provide the necessary information to the VPLMN or the HPLMN are invoked. It is possible for the HPLMN to instruct the VPLMN or IPLMN to interact with a gsmSCF which is controlled by the HPLMN.

The specification of operator specific services is outside the scope of the present document.

### 1.1 Support of CAMEL phase 4 subsets

An entity may support complete CAMEL phase 4 or, as a network option, complete CAMEL phase 3 functionality and one or more subsets of CAMEL phase 4.

The subsets of CAMEL phase 4 are the following:

- Relative to Circuit switched Call Control;

- CS call handling,

This subset contains the support of:

- Interactions with Optimal Routing;
- Call Party Handling;
- Mid call procedure for MO and MT calls;
- Inclusion of flexible tone injection;
- Provision of location information of called subscriber (Alerting phase); and
- Location information during an ongoing call (Handover DP).

~~Charging notification (with CS call handling),~~

~~This subset contains the support of:~~

~~Charging notification to the CSE.~~

- Relative to GPRS interworking;
- Notification of GPRS mobility management to CSE.

This subset contains the support of:

- Notification of GPRS mobility management to CSE.

- Relative to Short Message Services;
- CAMEL control over MT SMS.

This subset contains the support of:

- CAMEL control over MT SMS.

- Relative to Subscriber Location and State retrieval.
- GPRS Any Time Interrogation.

This subset contains the support of:

- Enhancement of Any Time Interrogation and Provide Subscriber Information for PS Domain.

A functional entity (VMSC, GMSC or SGSN) may support the subsets in any combination applicable for this entity; ~~except that a functional entity supporting "Charging notification" shall support also "CS call handling"~~. A functional entity will indicate to the HLR and/or gsmSCF all the subsets it supports.

### 1.1.1 CS call handling

This subset of CAMEL phase 4 contains the functionality specified in the following clause:

- Clause 4 "Circuit switched Call Control"; ~~except the items related to Charging notification as defined in subclause 1.1.2 "Charging notification"~~.

If the CAMEL phase 4 subset "CS call handling" is supported, then Clause 4 "Circuit switched Call Control" shall be supported.

This subset can be supported by the following functional entities: VMSC/VLR and GMSC.

### 1.1.2 ~~Charging notification~~

~~This subset of CAMEL phase 4 is only applicable if the subset "CS call handling" is supported.~~

If the CAMEL phase 4 subset "Charging notification" is supported, then the complete clause 4 "Circuit switched Call Control" shall be supported. If a functional entity supports this subset it shall also support the "CS call handling" subset.

~~The items related to Charging notification are defined in clause 4 "Circuit switched Call Control". They are:~~

- ~~— The handling of the input signals CAP\_Request\_Notification\_Charging, Int\_Event\_Notification\_Charging, in the SDL diagrams in subclause 4.5 "Procedures for CAMEL".~~
- ~~— The information flows Event Notification\_Charging and Request Notification\_Charging as defined in subclause 4.6 "Description of information flows".~~

~~This subset can be supported by the following functional entities: VMSC/VLR and GMSC.~~

### 1.1.23 GPRS mobility management

This subset of CAMEL phase 4 contains the functionality specified in the following clause:

- Clause 9 "Mobility Management" in respect to the SGSN.

If the CAMEL phase 4 subset "GPRS mobility management" is supported, then Clause 9 "Mobility Management" in respect to the SGSN shall be supported, except those parts clearly identified in that clause as being related to VLR.

This subset can be supported by the following functional entity: SGSN.

### 1.1.34 CAMEL control over MT SMS

This subset of CAMEL phase 4 contains the functionality specified in the following clause:

- Clause 7 "Short Message Services".

If the CAMEL phase 4 subset "CAMEL control over MT SMS" is supported, then clause 7 "Short Message Services" shall be implemented.

This subset can be supported by the following entities: SGSN and VMSC/VLR.

### 1.1.45 GPRS Any Time Interrogation

This subset of CAMEL phase 4 contains the functionality specified in the following clause:

- Clause 11 "Subscriber Location and State retrieval" in respect to the SGSN.

If the CAMEL phase 4 subset "GPRS Any Time Interrogation" is supported, then Clause 11 "Subscriber Location and State retrieval" in respect to the SGSN shall be supported, except those parts clearly identified in that clause as being related to VMSC/VLR or GMLC.

This subset of CAMEL phase 4 can be supported by the following functional entity: SGSN.

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## 4.5.2 Handling of mobile originated calls

### 4.5.2.1 Handling of mobile originated calls in the originating MSC

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

- Procedure CAMEL\_OCH\_MSC\_INIT;
- Procedure CAMEL\_MO\_Dialled\_Services;
- Procedure CAMEL\_OCH\_MSC\_ALERTING;
- Procedure CAMEL\_OCH\_MSC\_ANSWER;
- Procedure CAMEL\_OCH\_MSC1;
- Procedure CAMEL\_OCH\_MSC2;
- Procedure CAMEL\_OCH\_MSC\_DISC1;
- Procedure CAMEL\_OCH\_MSC\_DISC2;
- Procedure CAMEL\_OCH\_MSC\_DISC3;
- Procedure CAMEL\_OCH\_MSC\_DISC4;
- Procedure CAMEL\_OCH\_ETC;
- Procedure CAMEL\_OCH\_CTR;
- Procedure CAMEL\_Start\_TNRy;
- Procedure CAMEL\_Stop\_TNRy;
- Procedure CAMEL\_Store\_Destination\_Address;
- Procedure CAMEL\_Modify\_CUG\_Info;
- Procedure CAMEL\_N\_CSI\_CHECK\_MSC;
- Procedure CAMEL\_OCH\_LEG1\_MSC;
- Procedure CHECK\_DIGIT\_STRING\_MSC;
- Process CAMEL\_OCH\_LEG2\_MSC;
- Process CAMEL\_OCH\_RECONNECT\_MSC;
- Procedure CAMEL\_EXPORT\_LEG\_MSC;
- Process CAMEL\_O\_CHANGE\_OF\_POSITION\_MSC.

NOTE: Procedure CAMEL\_OCH\_MSC\_DISC3 applies to CAMEL Phase 1 only.

The procedure Send\_Access\_Connect\_If\_Required is specified in 3GPP TS 23.018 [12].

The procedure CAMEL\_OCH\_LEG1\_MSC supervises the originating party only. The process CAMEL\_OCH\_LEG2\_MSC supervises the terminating party only. Hence, signals from the BSS are received by the procedure CAMEL\_OCH\_LEG1\_MSC and signals from the destination exchange are received by the process CAMEL\_OCH\_LEG2\_MSC.

The following paragraphs give details on the behaviour of the MSC in the procedures CAMEL\_OCH\_MSC\_INIT, CAMEL\_OCH\_ETC, CAMEL\_OCH\_ANSWER and CAMEL\_Store\_Destination\_Address.

#### 4.5.2.1.1 Actions of the MSC on receipt of Int\_Error

The MSC checks the default Call Handling parameter in the relevant CSI.

If the default call handling is release call, a Release is sent to the MS and an Abort to the VLR. The MSC then releases all call resources and the procedure CAMEL\_OCH\_MSC\_INIT ends.

If the default call handling is continue call, the MSC continues processing without CAMEL support. It sends Send\_Info\_For\_Ongoing\_Call to the VLR and waits in state Wait\_For\_MO\_Call\_Result.

#### 4.5.2.1.2 Actions of the MSC on receipt of Int\_Continue

The MSC continues processing without any modification of call parameters. At DP Analysed\_Information it sends Send Info For Ongoing Call information flow to the VLR and waits in state Wait\_For\_MO\_Call\_Result.

#### 4.5.2.1.3 Actions of the MSC on receipt of Int\_Continue\_With\_Argument

The MSC continues processing with modified call parameters. The MSC shall replace the call parameters by the information received in the Int\_Continue\_With\_Argument signal. Call parameters which are not included in the Int\_Continue\_With\_Argument signal 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.

#### 4.5.2.1.4 Actions of the MSC on receipt of Int\_Connect

The MSC continues processing with modified call parameters. The MSC shall transparently modify the call parameters with the received information. The MSC then sends a PROGRESS message to the MS. Call parameters which are not included in the Int\_Connect signal 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.

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

At DP Collected\_Information the MSC sets the O-CSI suppression parameter. If D-CSI and N-CSI are not present, the MSC sends a Send Info For Outgoing Call to the VLR and waits in state Wait\_For\_MO\_Call\_Result.

At DP Analysed\_Information it sets the D-CSI suppression parameter, sends a Send Info For Outgoing Call to the VLR and waits in state Wait\_For\_MO\_Call\_Result.

#### 4.5.2.1.5 Actions of the MSC on receipt of Int\_Release\_Call

A Release is sent to the MS, an abort to the VLR and a Release is sent to the destination exchange. The release cause received in the Int\_Release\_Call signal is used. The MSC then releases all call resources and the procedure CAMEL\_OCH\_MSC\_INIT ends.

#### 4.5.2.1.6 Actions of the MSC on receipt of Int\_Continue\_Without\_Leg2

If the MSC receives Int\_Continue\_Without\_Leg2 signal from the gsmSSF, in response to an Initial DP information flow, the MSC will continue the handling of the calling party (Leg1) without routing the call to a destination.

#### 4.5.2.1.7 Action of the MSC in procedure CAMEL\_OCH\_MSC\_ANSWER

If the MSC received a destination address from the GMSC in the ISUP Answer or Connect Message, the MSC relays the destination address to the gsmSSF in the Int\_DP\_O\_Answer signal.

NOTE 1: The sending of e-parameters by the gsmSCF after receiving the DP\_O\_Answer indication may be to late.

NOTE 2: If the MO call is not subject to Basic OR, then the destination address is generated by the MSC. If the MO call is subject to Basic OR, the MSC will receive a destination address from the GMSC in the ISUP Answer or Connect Message.

#### 4.5.2.1.8 Action of the MSC in procedure CAMEL\_OCH\_ETC

In procedure CAMEL\_OCH\_ETC (sheet 2) the MSC will remain in the Wait\_For\_Assisting\_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".

#### 4.5.2.1.9 Action of the MSC in procedure CAMEL\_Store\_Destination\_Address

The Int\_Store\_DA signal carries the value of the global variable Destination address and the parameters OR and Forwarding received in the procedure call.

#### 4.5.2.1.10 Procedure CAMEL\_OCH\_LEG1\_MSC

The Int\_DTMF\_Digit\_Received information flow is received from an internal process in the MSC that receives DTMF signalling from the MS. The handling of the internal process that receives DTMF signalling is out of scope of the present document. The playing of the received DTMF tones to the other parties in the call segment is out of scope of the present document.

#### 4.5.2.1.11 ~~Action of the MSC on receipt of Int\_Request\_Notification\_Charging~~

~~General handling of the Int\_Request\_Notification\_Charging signal is specified in subclause 4.5.13.~~

~~If an Int\_Request\_Notification\_Charging signal is received for leg1 (the calling party) then~~

- ~~— for the total (e values or units), the total charges (PLMN specific charges and Transit network charges) to be levied to leg1 shall be reported;~~
- ~~— for components (e values or units), the total charges to be levied to leg1 shall be reported per component.~~

~~If an Int\_Request\_Notification\_Charging signal is received for leg2 (the called party) then~~

- ~~— for the total (e values or units), the charges applicable for leg2 shall be reported in an Int\_Event\_Notification\_Charging signal;~~
- ~~— for components (e values or units), the charges applicable for leg2 shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

#### 4.5.2.1.12 Process CAMEL\_O\_CHANGE\_OF\_POSITION\_MSC

The signals HANDOVER COMPLETE and HANDOVER PERFORMED are specified in 3GPP TS 48.008 [36]. Signals RELOCATION REQUEST ACKNOWLEDGE, LOCATION REPORT and LOCATION REPORTING COMMAND are specified in 3GPP TS 25.413 [31].

— Next modified section —

### 4.5.3 Retrieval of routing information

#### 4.5.3.1 Retrieval of routing information in the GMSC

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

- Procedure CAMEL\_Set\_ORA\_Parameters;



- Procedure CAMEL\_MT\_GMSC\_INIT;
- Procedure CAMEL\_MT\_MSC\_ALERTING;
- Procedure CAMEL\_MT\_GMSC\_ANSWER;
- Procedure CAMEL\_MT\_GMSC\_DISC1;
- Procedure CAMEL\_MT\_GMSC\_DISC2;
- Procedure CAMEL\_MT\_GMSC\_DISC3;
- Procedure CAMEL\_MT\_GMSC\_DISC4;
- Procedure CAMEL\_MT\_GMSC\_DISC5;
- Procedure CAMEL\_MT\_GMSC\_DISC6;
- Procedure CAMEL\_MT\_CTR;
- Procedure CAMEL\_MT\_ETC;
- Procedure CAMEL\_Start\_TNRy;
- Procedure CAMEL\_Stop\_TNRy;
- Procedure CAMEL\_MT\_GMSC\_Notify\_CF;
- Procedure CAMEL\_MT\_LEG2\_GMSC;
- Process CAMEL\_MT\_LEG1\_GMSC;
- Procedure CAMEL\_MT\_RECONNECT\_GMSC.

NOTE: Procedure CAMEL\_MT\_GMSC\_DISC3 applies to CAMEL Phase 1 only.

The procedure Send\_ACM\_If\_Required is specified in 3GPP TS 23.018 [12].

The procedure CAMEL\_MT\_LEG2\_GMSC supervises the terminating party only. The process CAMEL\_MT\_LEG1\_GMSC supervises the originating party only. Hence, signals from the destination exchange are received by the procedure CAMEL\_MT\_LEG2\_GMSC and signals from the originating exchange are received by the process CAMEL\_MT\_LEG1\_GMSC.

The following paragraphs give details on the behaviour of the GMSC in the procedure CAMEL\_MT\_GMSC\_INIT.

#### 4.5.3.1.1 Action of the GMSC on receipt of Int\_Release\_Call

An ISUP Release message 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 the default call handling parameter in the T-CSI.

If the default call handling is release call, an ISUP Release message 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 continues call handling without CAMEL support.

#### 4.5.3.1.3 Action of the GMSC on receipt of Int\_Continue

If an FTN has been stored then the information received from the HLR is used to overwrite the 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 then a Send Routeing Info information flow including a T-CSI suppression parameter is sent to the HLR. The Send Routing Info information flow includes an indication of 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 then the information received from the HLR is used to overwrite the 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 then a Send Routeing Info information flow including a T-CSI suppression parameter is sent to the HLR. The Send Routing Info information flow includes an indication of 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 signal. 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 3GPP TS 29.078 [33]): 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 CS\_gsmSSF, an ISUP Release Message is sent to the originating exchange. The MSC then releases all call resources and the procedure CAMEL\_MT\_GMSC\_INIT returns result=fail.

Otherwise the following parameters, if received, are used to overwrite the corresponding ISUP parameters (for mapping see 3GPP TS 29.078 [33]): Destination Number, Calling Partys Category, Generic Number, Original Called Party ID, Redirecting Party ID and Redirection Information. Call parameters that are not included in the Int\_Connect signal 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 (in state Wait\_For\_Routeing\_Info\_2)

An exception event is reported to the process CS\_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 (in state Wait\_For\_Routeing\_Info\_2)

An ISUP IAM with the MSRN as the called party number is constructed.

#### 4.5.3.1.8 Action of the GMSC on receipt of Send\_Routeing\_Info ack with FTN (in state Wait\_For\_Routeing\_Info\_2)

The information received from the HLR is used to overwrite the corresponding call parameters (for details see 3GPP TS 23.018 [12]). The redirection counter is incremented.

#### 4.5.3.1.9 Action of the GMSC on receipt of Send\_Routeing\_Info ack with O-CSI and/or D-CSI 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 the FTN. The O-CSI and/or D-CSI is stored.

#### 4.5.3.1.10 Action of the GMSC in procedure CAMEL\_MT\_ETC

In the 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 information flow (for early call forwarding) or the Resume Call Handling information flow (for Optimal Routeing of Late Call Forwarding).

The Int\_DP\_T\_No\_Answer signal and Int\_DP\_T\_Busy signal include a parameter to indicate that the call has encountered conditional call forwarding. The gsmSSF will transfer this parameter to the Event Report BCSM information flow which it sends to the gsmSCF.

#### ~~4.5.3.1.12 Action of the GMSC on receipt of Int\_Request\_Notification\_Charging~~

~~General handling of the Int\_Request\_Notification\_Charging signal is specified in subclause 4.5.13.~~

~~If an Int\_Request\_Notification\_Charging signal is received for served subscriber then~~

~~— for the total (e values or units), the charges applicable for served subscriber shall be reported in an Int\_Event\_Notification\_Charging signal;~~

~~— for components (e values or units), the charges applicable for served subscriber shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

#### 4.5.3.1.13 Action of the MSC on receipt of Int\_Continue\_Without\_Leg2

If the MSC receives Int\_Continue\_Without\_Leg2 signal from the gsmSSF, in response to an Initial DP information flow, the MSC will continue the handling of the calling party (Leg1) without routeing the call to a destination.

— Next modified section —

## 4.5.4 Handling of mobile terminating calls

### 4.5.4.1 Handling of mobile terminating calls in the terminating VMSC

The functional behaviour of the terminating VMSC is specified in 3GPP TS 23.018 [12].

The behaviour specific to CAMEL is:

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

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

- Procedure CAMEL\_ICH\_VLR;
- Procedure CAMEL\_O\_CSI\_Check\_VLR;
- Procedure CAMEL\_D\_CSI\_Check\_VLR;
- Procedure CAMEL\_VT\_CSI\_Check\_VLR;
- Procedure CAMEL\_ICH\_MSC\_INIT;
- Procedure CAMEL\_MT\_VMSC\_Notify\_CF;
- Procedure CAMEL\_ICH\_LEG2\_MSC;
- Procedure CAMEL\_ICH\_LEG2\_CF\_MSC;
- Process CAMEL\_ICH\_LEG1\_MSC;
- Procedure CAMEL\_ICH\_RECONNECT\_MSC;
- Process CAMEL\_T\_CHANGE\_OF\_POSITION\_MSC.

The procedure CAMEL\_ICH\_LEG2\_MSC supervises the terminating party only. The procedure CAMEL\_ICH\_LEG2\_CF\_MSC supervises the forwarded-to party only. The process CAMEL\_ICH\_LEG1\_MSC supervises the originating party only. Hence, signals from the BSS are received by the procedure CAMEL\_ICH\_LEG2\_MSC, signals from the destination exchange are received by the procedure CAMEL\_ICH\_LEG2\_CF\_MSC and signals from the originating exchange are received by the process CAMEL\_ICH\_LEG1\_MSC.

#### 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 information flow from the VLR.

The Int\_DP\_T\_No\_Answer signal and Int\_DP\_T\_Busy signal include a parameter to indicate that the call has encountered conditional call forwarding. The gsmSSF will transfer this parameter to the Event Report BCSM information flow which it sends to the gsmSCF.

#### 4.5.4.1.2 Action of MSC on receipt of Int\_Continue\_Without\_Leg2

If the MSC receives Int\_Continue\_Without\_Leg2 signal from the gsmSSF, in response to an Initial DP information flow, the MSC will continue the handling of the calling party (Leg1) without routing the call to a destination.

#### 4.5.4.1.3 Procedure CAMEL\_ICH\_LEG2\_MSC

The Int\_DTMF\_Digit\_Received information flow is received from an internal process in the MSC that receives DTMF signalling from the MS. The handling of the internal process that receives DTMF signalling is out of scope of the present document. The playing of the received DTMF tones to the other parties in the call segment is out of scope of the present document.

#### 4.5.4.1.4 ~~Action of MSC on receipt of Int\_Request\_Notification\_Charging~~

~~General handling of the Int\_Request\_Notification\_Charging signal is specified in subclause 4.5.13.~~

~~If an Int\_Request\_Notification\_Charging signal is received for the served subscriber (leg2, the called party) then~~

- ~~— for the total (e values or units), the total charges (PLMN specific charges and Transit network charges) to be levied to the served subscriber shall be reported in an Int\_Event\_Notification\_Charging signal;~~
- ~~— for components (e values or units), the total charges to be levied to served subscriber shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

#### 4.5.4.1.5 Process CAMEL\_T\_CHANGE\_OF\_POSITION\_MSC

The signals HANDOVER COMPLETE and HANDOVER PERFORMED are specified in 3GPP TS 48.008 [36]. Signals RELOCATION REQUEST ACKNOWLEDGE, LOCATION REPORT and LOCATION REPORTING COMMAND are specified in 3GPP TS 25.413 [31].

**—Next modified section —**

### 4.5.5 Handling of forwarded calls

The handling of forwarded calls in the GMSC or the terminating VMSC is specified in 3GPP TS 23.018 [12]. The processes and procedures specific to CAMEL are specified in this subclause.

- Procedure CAMEL\_Check\_ORLCF\_VMSC;
- Procedure CAMEL\_CF\_MSC\_INIT;
- Procedure CAMEL\_CF\_MSC\_ALERTING;
- Procedure CAMEL\_CF\_MSC\_ANSWER;
- Procedure CAMEL\_CF\_ETC;
- Procedure CAMEL\_CF\_CTR;
- Procedure CAMEL\_MT\_CF\_LEG1\_MSC;
- Process CAMEL\_MT\_CF\_LEG2\_MSC;
- Procedure CAMEL\_MF\_RECONNECT\_MSC.

The procedure CAMEL\_MT\_CF\_LEG1\_MSC supervises the originating party only. The process CAMEL\_MT\_CF\_LEG2\_MSC supervises the forwarding-to party only. Hence, signals from the originating exchange are received by the procedure CAMEL\_MT\_CF\_LEG1\_MSC and signals from the destination exchange are received by the process CAMEL\_MT\_CF\_LEG2\_MSC.

A mobile terminated call can be forwarded either in the GMSC (indicated by provision of Forwarded-To-Number from the HLR or gsmSCF) or in the MSC (indicated by provision of Forwarded-To-Number from the VLR).

#### 4.5.5.1 Procedure CAMEL\_CF\_MSC\_INIT: handling of Int\_Continue\_With\_Argument

The received parameters are used to overwrite the corresponding ISUP parameters (for mapping see 3GPP TS 29.078 [33]). Call parameters which are not included in the Int\_Continue\_With\_Argument signal 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.

#### 4.5.5.2 Procedure CAMEL\_CF\_MSC\_INIT: handling of Int\_Connect

The received parameters are used to overwrite the corresponding ISUP parameters (for mapping see 3GPP TS 29.078 [33]). Call parameters which are not included in the Int\_Connect signal 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 Party's 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.

#### 4.5.5.3 Procedure CAMEL\_CF\_MSC\_INIT: handling of Int\_Continue\_Without\_Leg2

If the MSC receives Int\_Continue\_Without\_Leg2 signal from the gsmSSF, in response to an Initial DP information flow, the MSC will continue the handling of the calling party (Leg1) without routing the call to a destination.

#### 4.5.5.4 Action of the MSC in procedure CAMEL\_CF\_MSC\_ANSWER

If the MSC received a destination address from the GMSC in the ISUP Answer or ISUP Connect Message then the MSC relays the destination address to the gsmSSF in the Int\_DP\_O\_Answer signal.

#### 4.5.5.5 Action of the MSC in procedure CAMEL\_CF\_ETC

In procedure CAMEL\_CF\_ETC (sheet 2) the GMSC or terminating VMSC will remain in the Wait\_For\_Assisting\_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).

#### ~~4.5.5.6 Action of MSC on receipt of Int\_Request\_Notification\_Charging~~

~~General handling of the Int\_Request\_Notification\_Charging signal is specified in subclause 4.5.13.~~

~~If an Int\_Request\_Notification\_Charging signal is received for the served subscriber (the forwarding party) then~~

~~— for the total (e-values or units), the total charges (PLMN specific charges and Transit network charges) to be levied to the served subscriber shall be reported in an Int\_Event\_Notification\_Charging signal;~~

~~— for components (e-values or units), the total charges to be levied to the served subscriber shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

~~If an Int\_Request\_Notification\_Charging signal is received for leg2 (the forwarded to party) then~~

~~— for the total (e-values or units), the charges applicable for leg2 shall be reported in an Int\_Event\_Notification\_Charging signal;~~

~~— for components (e-values or units), the charges applicable for leg2 shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

**— Next modified section —**

#### 4.5.6.2 Handling of gsmSCF initiated calls in the VLR

Handling of gsmSCF initiated calls in the VLR involves the following process and procedures:

- Process CAMEL\_ICA\_VLR.

##### ~~4.5.6.2.1 Action of the MSC on receipt of Int\_Request\_Notification\_Charging~~

~~General handling of the Int\_Request\_Notification\_Charging signal is specified in subclause 4.5.13.~~

~~If an Int\_Request\_Notification\_Charging signal is received for the served subscriber in a gsmSCF initiated new call (NC call case) then~~

~~— for the total (e values or units), the charges applicable for the leg shall be reported in an Int\_Event\_Notification\_Charging signal;~~

~~— for components (e values or units), the charges applicable for the leg shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

If an Int\_Request\_Notification\_Charging signal is received for a gsmSCF initiated new party in an existing call then

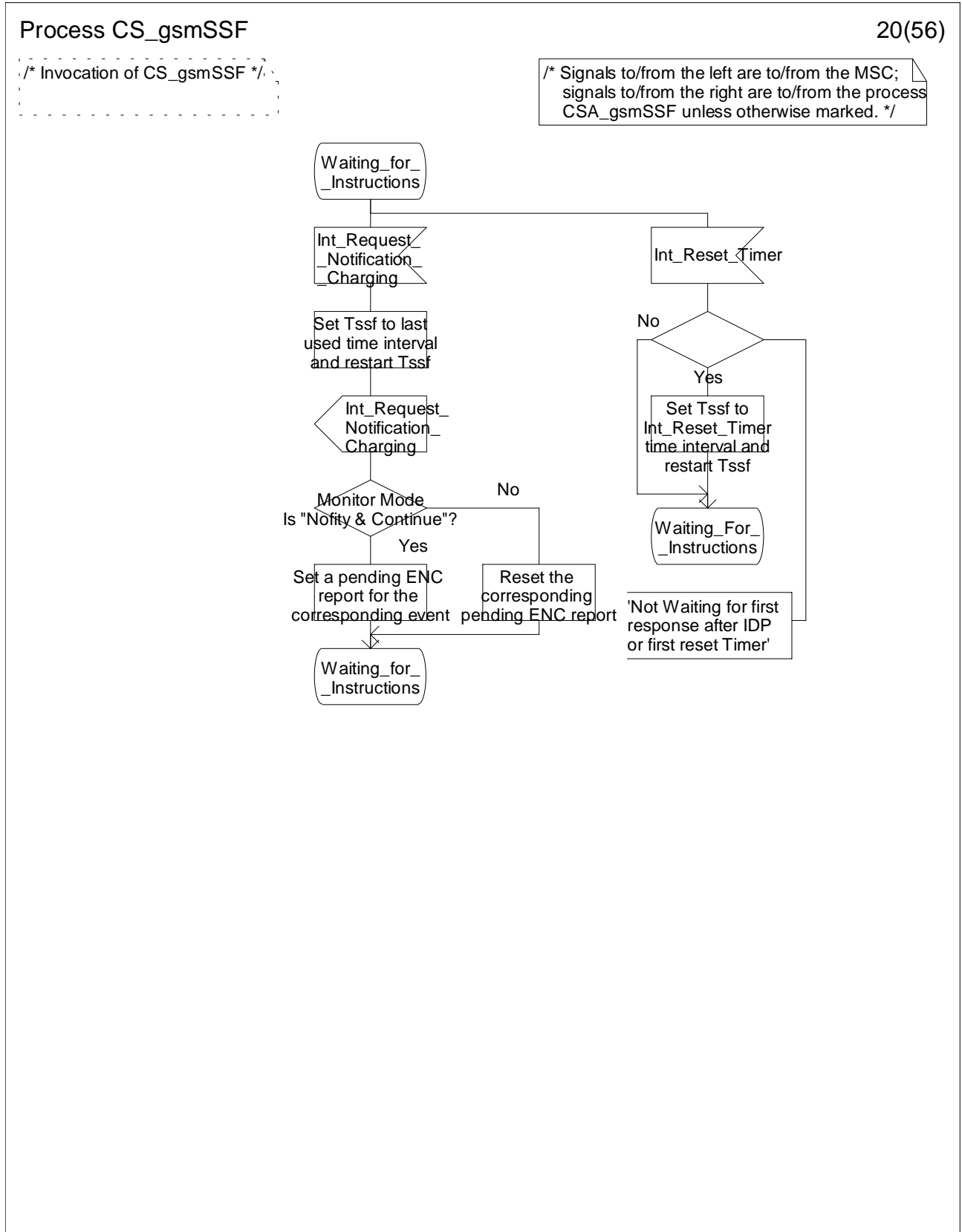
~~— for the total (e values or units), the charges applicable for the new party shall be reported in an Int\_Event\_Notification\_Charging signal;~~

~~— for components (e values or units), the charges applicable for the new party shall be reported per component in an Int\_Event\_Notification\_Charging signal.~~

— Next modified section —

4.5.7.4 Process CS\_gsmSSF and procedures

...





Process CS\_gsmSSF

20(56)

/\* Invocation of CS\_gsmSSF \*/

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

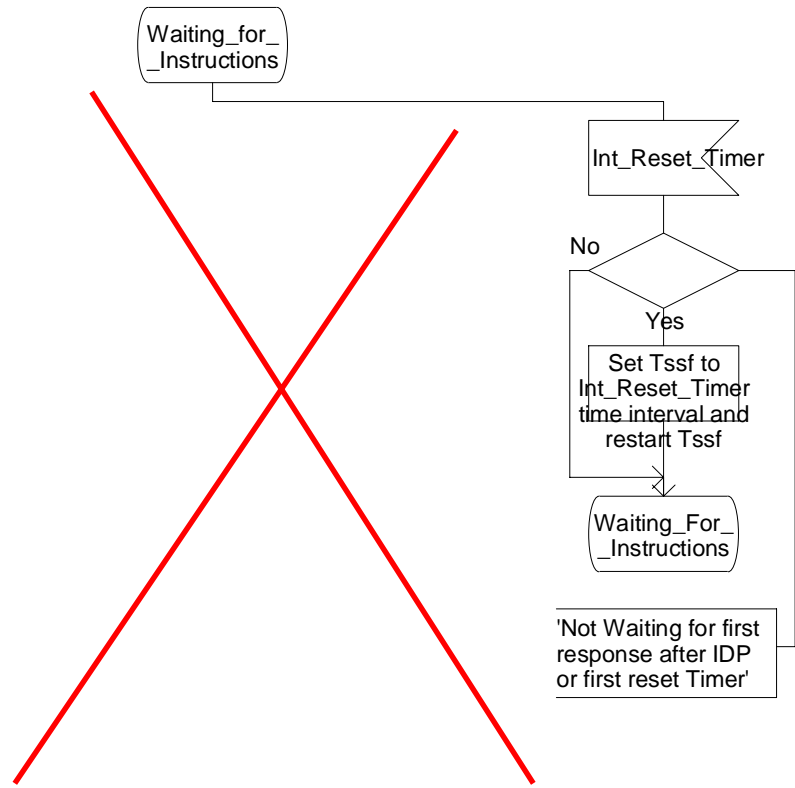


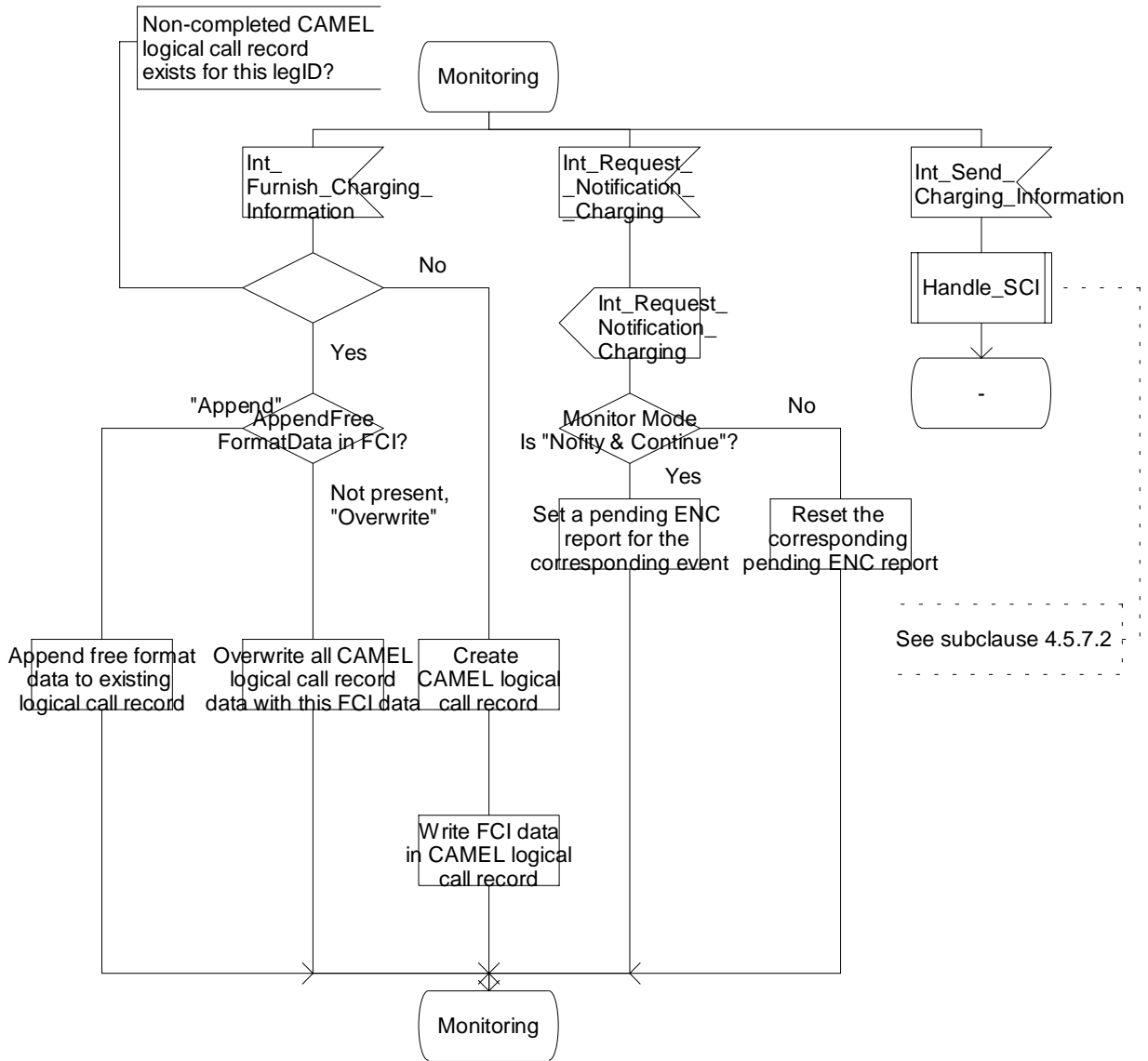
Figure 4.95t: Process CS\_gsmSSF (sheet 20)

Process CS\_gsmSSF

30(56)

/\* Invocation of CS\_gsmSSF \*/

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



# Process CS\_gsmSSF

30(56)

/\* Invocation of CS\_gsmSSF \*/

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

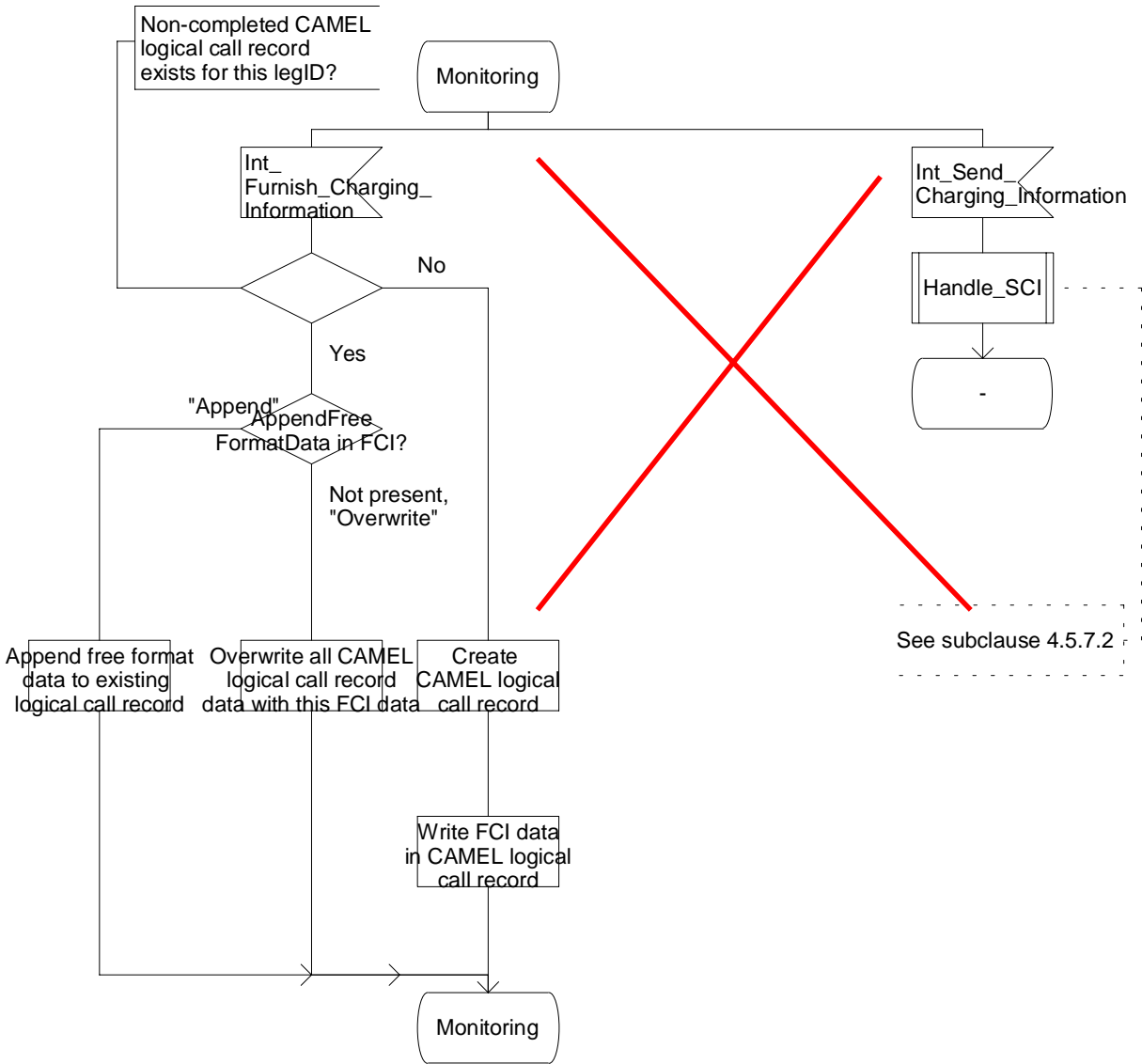


Figure 4.95dd: Process CS\_gsmSSF (sheet 30)

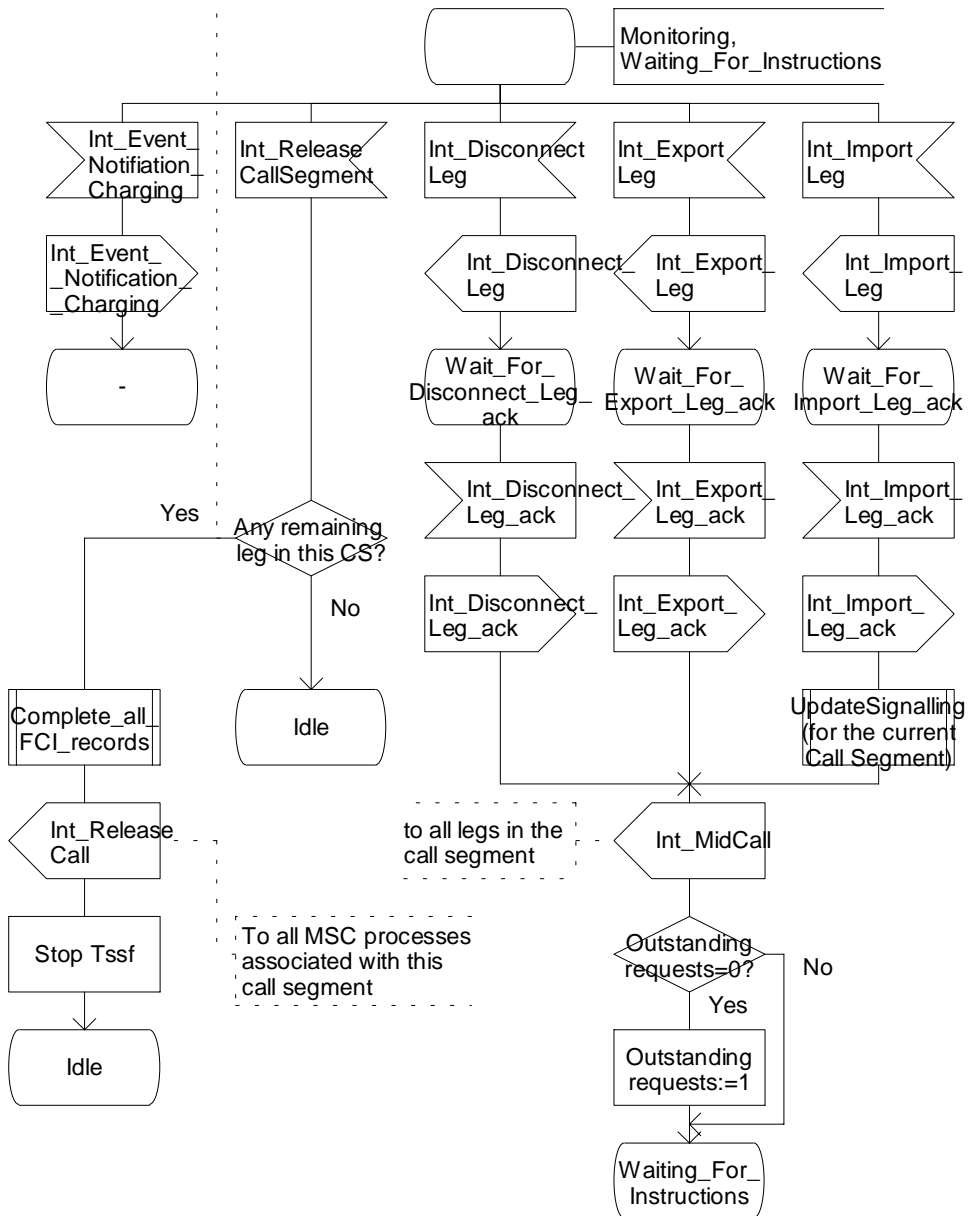
Process CS\_gsmSSF

38(56)

/\* Invocation of CS\_gsmSSF \*/

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

During cleanup of 23.078, if it is decided that the CSA\_gsmSSF, after receiving an Application End or Abort signal, shall terminate CSs by sending an Int\_Release Call instead of an Int\_Release CallSegment signal, this decision box shall be removed and processing shall continue from the 'No' branch as it did before this decision box was added.



# Process CS\_gsmSSF

38(56)

/\* Invocation of CS\_gsmSSF \*/

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

During cleanup of 23.078, if it is decided that the CSA\_gsmSSF, after receiving an Application End or Abort signal, shall terminate CSs by sending an Int\_Release Call instead of an Int\_Release CallSegment signal, this decision box shall be removed and processing shall continue from the 'No' branch as it did before this decision box was added.

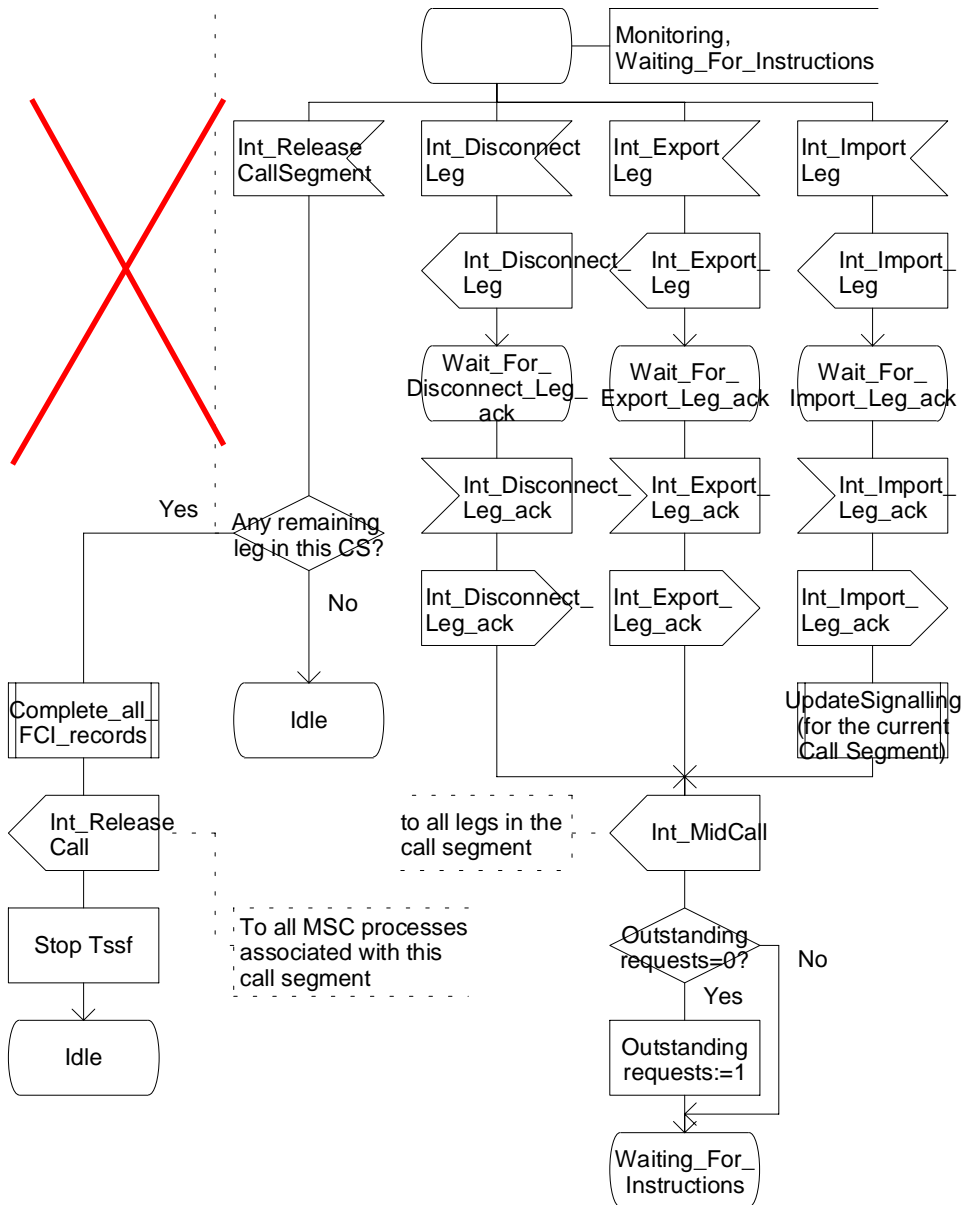


Figure 4.95II: Process CS\_gsmSSF (sheet 38)

— **Next modified section** —

#### 4.5.7.6 Process CSA\_gsmSSF and procedures

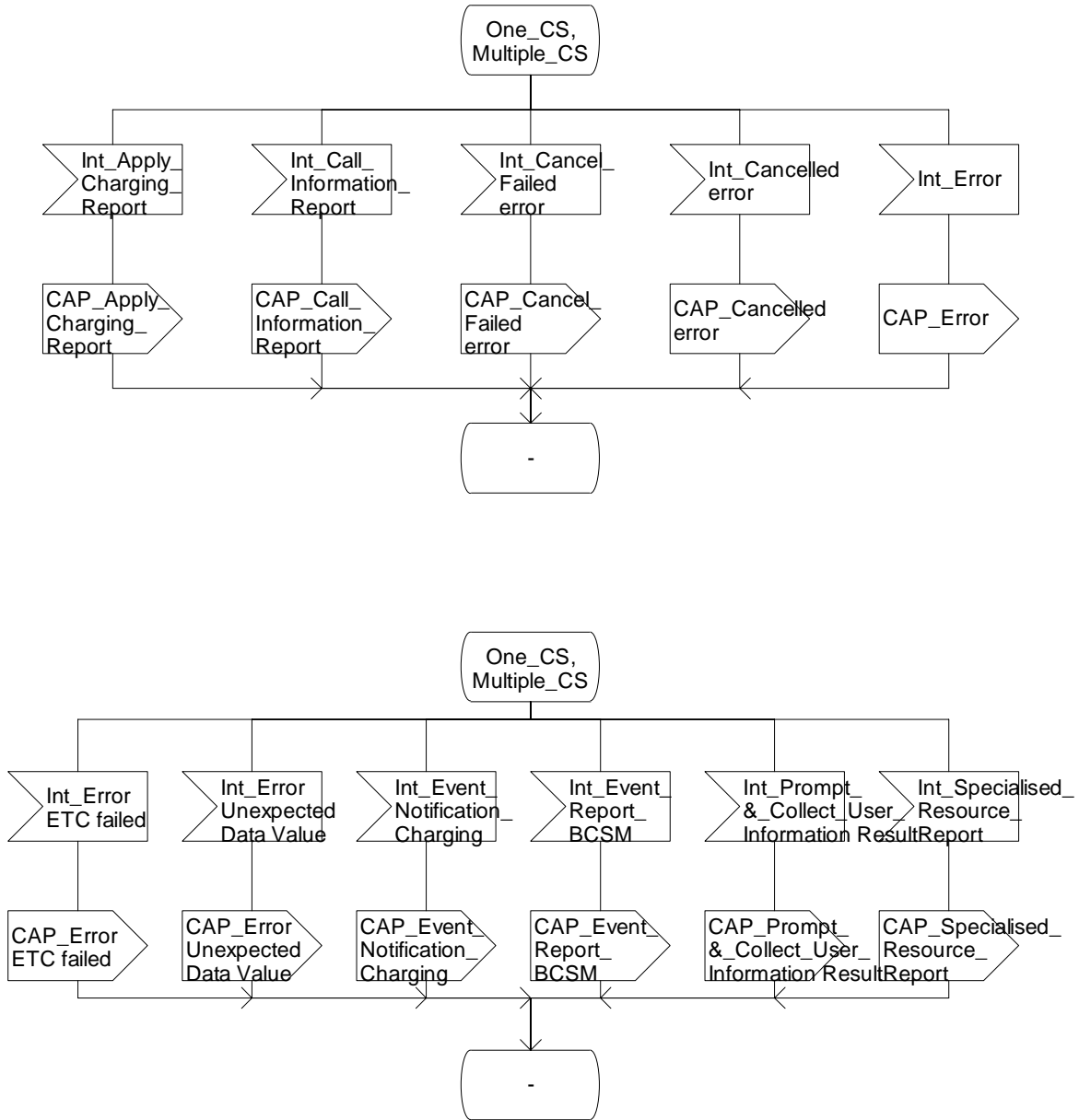
The call gap information flow can only be received for an opened transaction between the CSA\_gsmSSF and the gsmSCF.

Process CSA\_gsmSSF

4(21)

/\* A process in the gsmSSF to co-ordinate the Call Segments for a call. \*/

/\* Signals to/from the left are to/from one or more instances of the process CS\_gsmSSF; signals to/from the right are to/from the gsmSCF. \*/



Process CSA\_gsmSSF

4(21)

/\* A process in the gsmSSF to co-ordinate the Call Segments for a call. \*/

/\* Signals to/from the left are to/from one or more instances of the process CS\_gsmSSF; signals to/from the right are to/from the gsmSCF. \*/

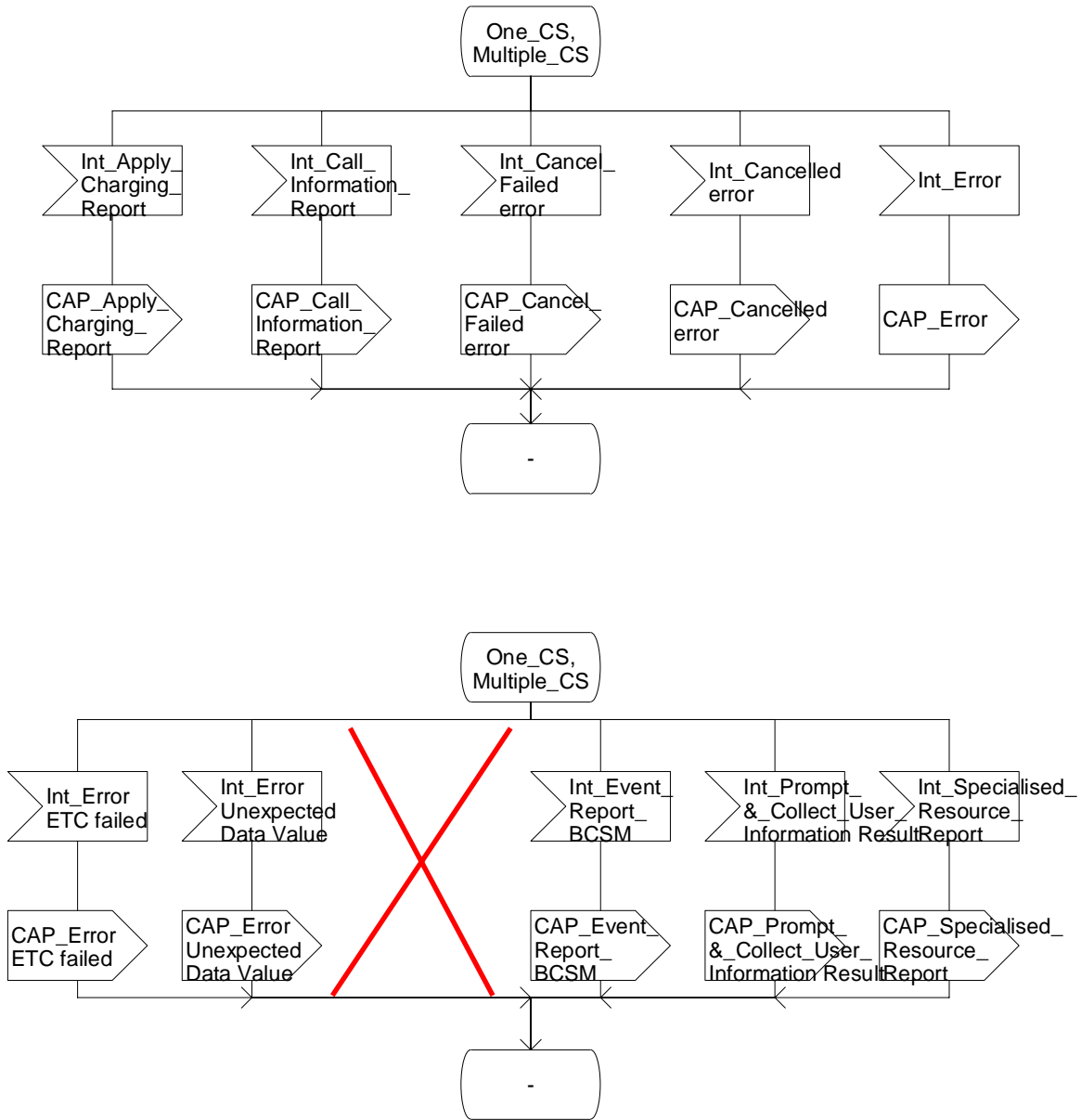


Figure 4.112d: Process CSA\_gsmSSF (sheet 4)



### Process CSA\_gsmSSF

5(21)

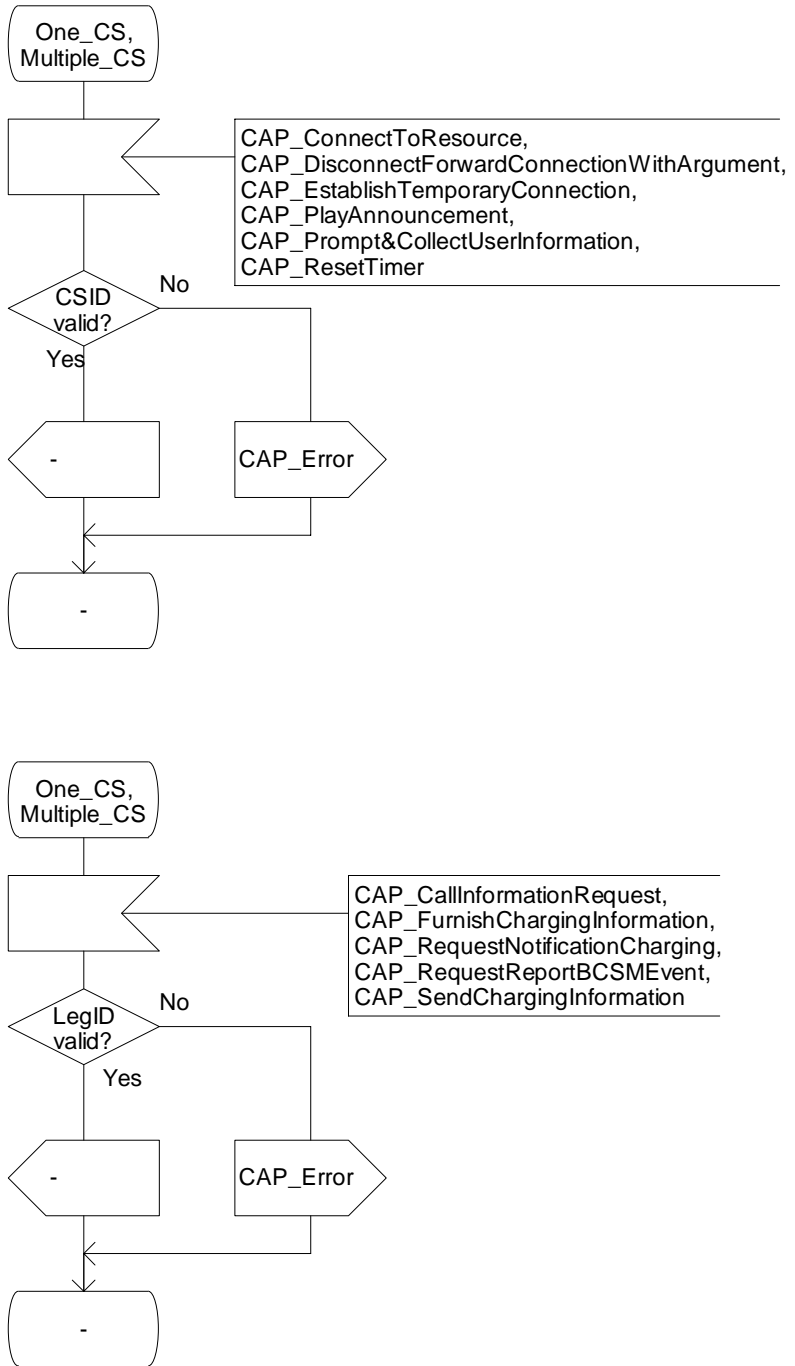
/\* A process in the gsmSSF to co-ordinate the Call Segments for a call. \*/

/\* Signals to/from the left are to/from one or more instances of the process CS\_gsmSSF; signals to/from the right are to/from the gsmSCF. \*/

Relay the operation to the Process CS\_gsmSSF for the indicated CS ID

Or Party To Charge

Relay the operation to the Process CS\_gsmSSF for the CS containing the indicated LegID



Process CSA\_gsmSSF

5(21)

/\* A process in the gsmSSF to co-ordinate the Call Segments for a call. \*/

/\* Signals to/from the left are to/from one or more instances of the process CS\_gsmSSF; signals to/from the right are to/from the gsmSCF. \*/

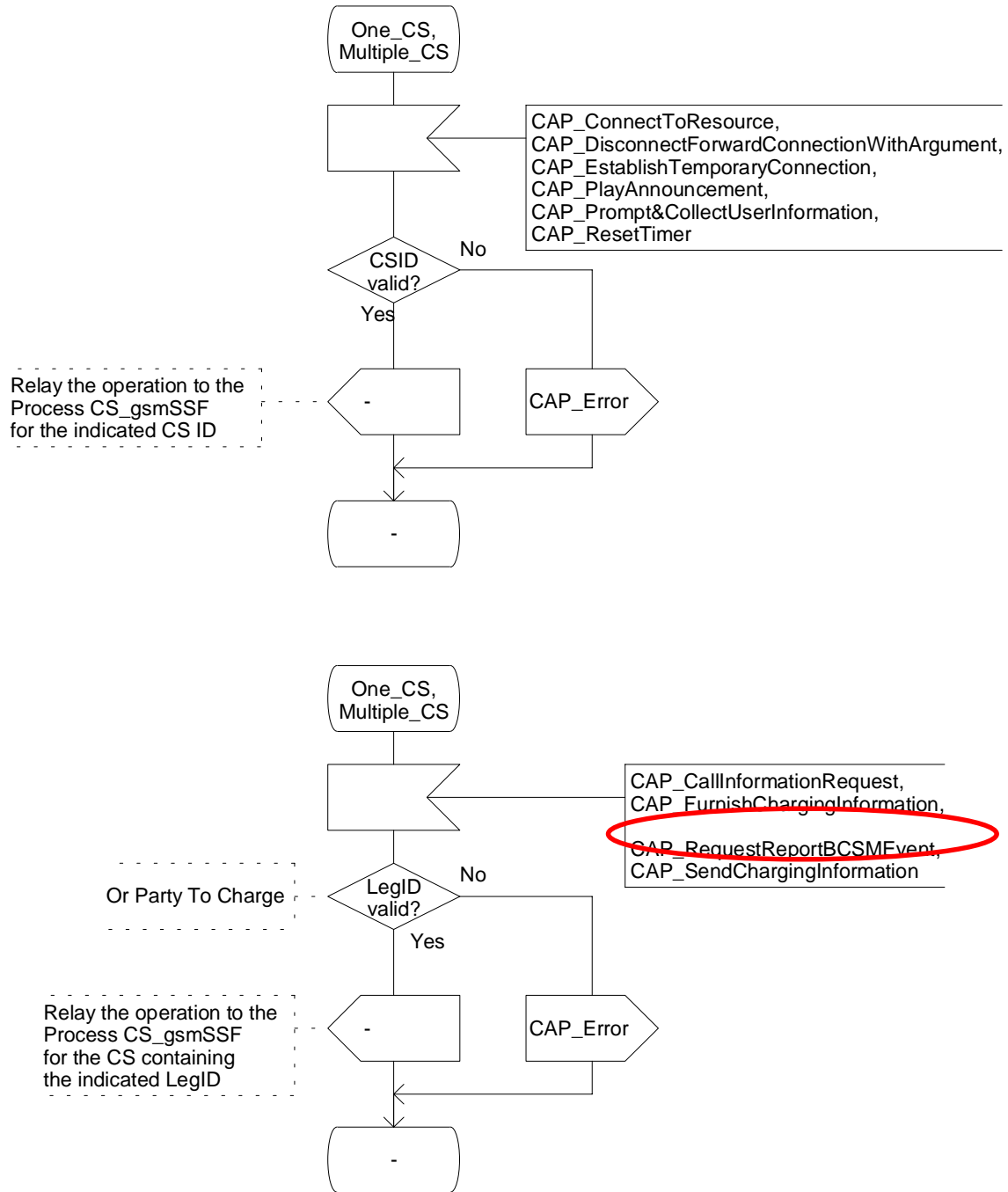


Figure 4.112e: Process CSA\_gsmSSF (sheet 5)

— Next modified section —

### 4.5.13 Handling of Int\_Request\_Notification\_Charging at MSC

If an Int\_Request\_Notification\_Charging signal is received with "Notify And Continue" mode for a particular leg then the MSC starts monitoring the charging events for the indicated leg. If an Int\_Request\_Notification\_Charging signal is received with "Transparent" mode for a particular leg then the MSC stops monitoring the charging events for the indicated leg. An Int\_Request\_Notification\_Charging signal with "Notify And Continue" mode a particular leg overrides any previous Int\_Request\_Notification\_Charging signal for that leg.

The requested charging events for a particular leg are monitored until one of the following events occurs:

- Request Notification Charging information flow with transparent mode for corresponding event is received.
- The end of leg occurs.

Based on the "Event type Charging" for the leg being monitored and the "reporting condition", the MSC sends the charging notifications to the process CS\_gsmSSF.

1. If the event type charging IE contains "e values" and the reporting condition IE contains "Occurrence Of Event" then
  - The charging notifications are sent when the charging parameters (e values) applicable for the leg are determined. This is based on the charging information available in the MSC or the charging information received from the charge controlling exchange (from the SS7 network through which the call is being routed);
  - When a new set of charging parameters are applicable for the leg and/or a charging information flow is received from the charge controlling exchange due to a tariff switch, the MSC shall send the next charging notification to the CS\_gsmSSF process.
2. If the event type charging IE contains "Units" and the reporting condition IE contains "threshold" then
  - The charging notifications are sent periodically on accumulation of specified threshold units for the monitored leg and when the leg clears. If there are no pending units to be reported at the end of the leg after the last sent charging notification then no charging notification shall be sent.
3. If the event type charging IE contains "Units" and the reporting condition IE contains "End Of Connection" then
  - The accumulated charge units for the leg are reported to the process CS\_gsmSSF when the leg clears.

There is at most one charging notification pending for each leg. If the gsmSCF does not require charging for a leg then it will not send a Request Notification Charging information flow for that leg.

NOTE: The interactions between Charging Notifications and SCI are for further study.

— Next modified section —

#### 4.6.1.6 Event Notification Charging

##### 4.6.1.6.1 Description

This IF is used by the gsmSSF to report to the gsmSCF the charging information requested in the Request Notification Charging IF.

## 4.6.1.6.2 Information elements

Information element name	MO	MF	MT	VT	NC	NP	Description
Event Specific Charging Information	M	M	M	M	M	M	This IE is described in a table below. This IE contains the charging information provided by the gsmSSF.
Leg ID	M	M	M	M	M	M	This IE indicates the leg for which event is being reported.

Event Specific Charging Information contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Info-Charge Units Total	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if total charge units were requested. This contains the accumulated charge units.
Info-Charge Units components	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if charge units were reported for the list of charging components. This IE contains the list of charging components and accumulated components which have been monitored.
Info e-values Total	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if the net applicable e-values were requested. This IE contains the applicable e-values.
Info e-values Components	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if e-values were requested for the list of charging components. This IE contains the list of charging components and applicable e-values for the monitored components.

Info-Charge Units Total contains the following information:

Information element name	MO	MF	MT	VT	NC	NP	Description
Reporting Condition Units	M	M	M	M	M	M	This IE is described in a table below. This IE is received in related Request Notification Charging IF. This IE shall be a copy of the corresponding IE received in the Request Notification Charging IF.
Charge Units	M	M	M	M	M	M	This IE contains the accumulated charge units which have been monitored.

Info-Charge Units Components contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Reporting Condition Units	M	M	M	M	M	M	This IE is described in a table below. This IE is received in the related Request Notification Charging IF. This IE shall be a copy of the corresponding IE received in the Request Notification Charging IF.
Charge Units	M	M	M	M	M	M	This IE contains the accumulated charge units which have been monitored.
Monitor Component	M	M	M	M	M	M	This IE is described in a table below. This IE contains the specific charging component which has been monitored.

Info e-values Total contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Reporting Condition-Evalue	M	M	M	M	M	M	This IE is described in a table below. This IE is received in the related Request Notification Charging IF. This IE shall be a copy of the corresponding IE received in the Request Notification Charging IF.
e-values And Tsw	M	M	M	M	M	M	This IE is described in a table below. This IE contains the e-values and the duration for which these e-values are applicable.

Info e-values Components contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Reporting Condition e-values	M	M	M	M	M	M	This IE is described in a table below. This IE is received in the related Request Notification Charging IF. This IE shall be a copy of the corresponding IE received in the Request Notification Charging IF.
e-values And Tsw	M	M	M	M	M	M	This IE is described in a table below. This contains the e-values and the duration for which these e-values are applicable.
Monitor Component	M	M	M	M	M	M	This IE is described in a table below. This IE contains the specific charging component which has been monitored.

Reporting Condition Units contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
End Of Connection	S,E	S,E	S,E	S,E	S,E	S,E	This IE shall be present if the charge units were requested when the leg clears.
Threshold Counter Value	S,E	S,E	S,E	S,E	S,E	S,E	This IE shall be present if the charge units were requested after exceeding or equalling the threshold.

Monitor Component contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Charges Specific PLMN	C	C	C	C	C	C	This IE indicates the PLMN specific charges at the serving MSC determined by the operator based on radio resource utilization, roaming etc.
Charges Transit Network	C	C	C	C	C	C	This IE indicates the specific charges at the serving MSC based on the charging information received from the transit network.

Reporting Condition e-values contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Occurrence Of Event	M	M	M	M	M	M	This IE indicates that the e-values are reported immediately after the occurrence of any charging event related to the indicated leg.

e-values And Tsw contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
CAI-Elements	M	M	M	M	M	M	This IE contains CAI elements as described in 3GPP TS 22.024 [3].
Tariff Switch Interval	M	M	M	M	M	M	This IE contains the time duration for which reported e-values are applicable.

— Next modified section —

#### 4.6.2.19 Request Notification Charging

##### 4.6.2.19.1 Description

This IF is used to request the gsmSSF to monitor and report the e-values or charge units generated by MSC or transit network.

The gsmSCF is allowed to send this information flow only if the CAMEL phase 4 subset Charging Notification is supported by the gsmSSF.

##### 4.6.2.19.2 Information elements

Information element name	MO	MF	MT	VT	NC	NP	Description
Event type Charging	M	M	M	M	M	M	This IE is described in a table below. This IE indicates the charging event type that has to be monitored.
Monitor mode	M	M	M	M	M	M	This IE indicates the monitor mode applicable for the corresponding "eventTypeCharging". Monitor mode can be NotifyandContinue and Transparent only.
Legid	M	M	M	M	M	M	This IE indicates the leg for which the charging event has to be monitored.

Event type Charging contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Charge Units Total	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if the accumulated charge units are to be monitored.
Charge Units Components	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if the charge units are to be monitored for list of charging components.
e-values Total	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if the net applicable e-values are to be monitored.
e-values Components	S,E	S,E	S,E	S,E	S,E	S,E	This IE is described in a table below. This IE shall be present if e-values are to be monitored for list of charging components.

Charge Units Total contains the following information element:

Information element name	MO	MF	MT	VT	NC	NP	Description
Reporting Condition Units	M	M	M	M	M	M	This IE is described in a table below. This IE indicates the reporting condition which must be satisfied for the indicated leg before reporting charge units.

Charge Units Components contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Monitor Component	M	M	M	M	M	M	This IE is described in a table below. This IE indicates the specific charging component to be monitored.
Reporting Condition Units	M	M	M	M	M	M	This IE indicates the reporting condition which must be satisfied for the indicated leg before reporting charge units.

e-values Total contains the following information element:

Information element name	MO	MF	MT	VT	NC	NP	Description
Reporting Condition e-values	M	M	M	M	M	M	This IE is described in a table below. This IE indicates the reporting condition which must be satisfied for the indicated leg before reporting e-values.

e-values Components contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Monitor Component	M	M	M	M	M	M	This IE indicates the specific charging component to be monitored.
Reporting Condition Evalue	M	M	M	M	M	M	This IE indicates the reporting condition which must be satisfied for the indicated leg before reporting e-values.

Reporting Condition Units contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
End Of Connection	S,E	S,E	S,E	S,E	S,E	S,E	This IE shall be present if the charge units are to be reported when the leg clears.
Threshold Counter Value	S,E	S,E	S,E	S,E	S,E	S,E	This IE indicates the threshold value. This IE shall be present if the charge units are to be reported when threshold is reached or exceeded.

Monitor Component contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Charges Specific PLMN	G	G	G	G	G	G	This IE indicates that the PLMN specific charges at the serving MSC determined by operator based on radio resource utilization, roaming etc are to be monitored.
Charges Transit Network	G	G	G	G	G	G	This IE indicates that the specific charges at the serving MSC based on the charging information received from the transit network are to be monitored.

Reporting Condition e-values contains the following information element:

Information element name	MO	MF	MT	VT	NC	NP	Description
Occurrence Of Event	M	M	M	M	M	M	This IE indicates that the e-values are to be reported immediately after occurrence of any charging event related to the indicated leg.

CR-Form-v7

## CHANGE REQUEST

⌘ **29.078 CR 259** ⌘ rev **-** ⌘ Current version: **5.0.0** ⌘

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

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

<b>Title:</b>	⌘	Removal of ChargingNotification feature	
<b>Source:</b>	⌘	Alcatel	
<b>Work item code:</b>	⌘	CAMEL4	<b>Date:</b> ⌘ 27/06/2002
<b>Category:</b>	⌘	<b>C</b>	<b>Release:</b> ⌘ Rel-5
		Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:
		<b>F</b> (correction)	2 (GSM Phase 2)
		<b>A</b> (corresponds to a correction in an earlier release)	R96 (Release 1996)
		<b>B</b> (addition of feature),	R97 (Release 1997)
		<b>C</b> (functional modification of feature)	R98 (Release 1998)
		<b>D</b> (editorial modification)	R99 (Release 1999)
		Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	⌘	Stage 1 has removed the "Charging Notification procedure". This needs to be reflected in the CAMEL stage 2 and stage 3 as well.
<b>Summary of change:</b>	⌘	Removal of ChargingNotification feature
<b>Consequences if not approved:</b>	⌘	Inconsistent set of CAMEL Phase 4 specifications.

<b>Clauses affected:</b>	⌘	5.1, 5.3, 5.5, 5.6, 6.1.1, 6.1.2.1, 11.18, 11.28								
<b>Other specs affected:</b>	⌘	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </table> Other core specifications ⌘ Rel-5 23.078-CR417, Rel-5 29.002-CR480	Y	N	X			X		X
Y	N									
X										
	X									
	X									
<b>Other comments:</b>	⌘									



— First modified section —
----------------------------

## 5 Common CAP Types

### 5.1 Data types

CAP-datatypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3) cap-datatypes(52) version4(3)}

DEFINITIONS IMPLICIT TAGS ::= BEGIN

...

```
ChargeUnitsComponent ::= SEQUENCE SIZE
  (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
  monitorComponent [0] MonitorComponent,
  reportingConditionUnits [1] ReportingConditionUnits
  }
```

```
ChargeUnitsTotal ::= SEQUENCE {
  reportingConditionUnits [0] ReportingConditionUnits
  }
```

...

```
EvaluesAndTsw ::= SEQUENCE {
  evalues [0] CAI-GSM0224,
  tariffsSwitchInterval [1] TariffsSwitchInterval
  }
```

```
EvaluesComponent ::= SEQUENCE SIZE
  (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
  monitorComponent [0] MonitorComponent,
  reportingConditionEvaluate [1] ReportingConditionEvaluate
  }
```

```
EvaluesTotal ::= SEQUENCE {
  ReportingConditionEvaluate [0] ReportingConditionEvaluate
  }
```

```
EventSpecificChargingInformation {PARAMETERS BOUND : bound} ::= CHOICE {
  infoChargeUnitsTotal [0] InfoChargeUnitsTotal,
  infoChargeUnitsComponents [1] InfoChargeUnitsComponents {bound},
  infoEvaluateTotal [2] InfoEvaluateTotal,
  infoEvaluateComponents [3] InfoEvaluateComponents {bound}
  }
```

...

```
EventTypeChargingPLMN {PARAMETERS BOUND : bound} ::= CHOICE {
  ChargeUnitsTotal [0] ChargeUnitsTotal,
  ChargeUnitsComponent [1] ChargeUnitsComponent {bound},
  EvaluesTotal [2] EvaluesTotal,
  EvaluesComponent [3] EvaluesComponent {bound}
  }
```

This parameter indicates the charging event type.

...

```
InfoChargeUnitsComponents ::= SEQUENCE SIZE
  (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
  reportingConditionUnits [0] ReportingConditionUnits,
  units [1] Units,
  monitorComponent [2] MonitorComponent
  }
```

```
InfoChargeUnitsTotal ::= SEQUENCE {
  ReportingConditionUnits [0] ReportingConditionUnits,
  Units [1] Units
  }
```

```
InfoEvaluateComponents ::= SEQUENCE SIZE
  (bound.&minComponentLength .. bound.&maxComponentLength) OF SEQUENCE {
```

```


reportingConditionValue [0] ReportingConditionValue,
valuesAndTsw [1] ValuesAndTsw,
monitorComponent [2] MonitorComponent
}

InfoValueTotal ::= SEQUENCE {
  ReportingConditionValue [0] ReportingConditionValue,
  ValuesAndTsw [1] ValuesAndTsw
}

...

MonitorComponent ::= ENUMERATED {
  ChargesTransitNetwork (0),
  ChargesSpecificPLMN (1)
}

...

ReportingConditionUnits ::= CHOICE {
  EndOfConnection [0] IMPLICIT NULL,
  ThresholdCounterValue [1] IMPLICIT INTEGER {SIZE(4)}
}

ReportingConditionValue ::= CHOICE {
  OccurrenceOfEvent [0] IMPLICIT NULL
}

...

Units ::= INTEGER (1 .. 10000)

...

END


```

— Next modified section —

## 5.3 Operation codes

```

CAP-operationcodes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-operationcodes(53) version4(3)}

```

```

DEFINITIONS ::= BEGIN

```

```

IMPORTS

```

```

  ros-InformationObjects
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

```

```

  Code
FROM Remote-Operations-Information-Objects ros-InformationObjects

```

```

;

```

```

-- the operations are grouped by the identified operation packages.

```

```

...

```

```


-- Charging Event handling Package
opcode-requestNotificationChargingEvent Code ::= local: 25
opcode-eventNotificationCharging Code ::= local: 26


```

```

...

```

```

END

```

— Next modified section —
---------------------------

## 5.5 Classes

```
CAP-classes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-classes(54) version4(3)}
```

```
DEFINITIONS ::= BEGIN
```

```
...
```

```
PARAMETERS-BOUND ::= CLASS {
    &minAccessPointNameLength          INTEGER,
    &maxAccessPointNameLength          INTEGER,
    &minAChBillingChargingLength        INTEGER,
    &maxAChBillingChargingLength        INTEGER,
    &minAttributesLength                INTEGER,
    &maxAttributesLength                INTEGER,
    &maxBearerCapabilityLength          INTEGER,
    &minCalledPartyBCDNumberLength      INTEGER,
    &maxCalledPartyBCDNumberLength      INTEGER,
    &minCalledPartyNumberLength         INTEGER,
    &maxCalledPartyNumberLength         INTEGER,
    &minCallingPartyNumberLength        INTEGER,
    &maxCallingPartyNumberLength        INTEGER,
    &minCallResultLength                INTEGER,
    &maxCallResultLength                INTEGER,
    &minCarrierLength                   INTEGER,
    &maxCarrierLength                   INTEGER,
    &minCauseLength                     INTEGER,
    &maxCauseLength                     INTEGER,
&minComponentLength                  INTEGER,
&maxComponentLength                  INTEGER,
    &minDigitsLength                    INTEGER,
    &maxDigitsLength                    INTEGER,
    &minFCIBillingChargingDataLength    INTEGER,
    &maxFCIBillingChargingDataLength    INTEGER,
    &minFCIBillingChargingLength        INTEGER,
    &maxFCIBillingChargingLength        INTEGER,
    &minGenericNumberLength             INTEGER,
    &maxGenericNumberLength             INTEGER,
    &minGPRSCauseLength                 INTEGER,
    &maxGPRSCauseLength                 INTEGER,
    &minIPSSPCapabilitiesLength         INTEGER,
    &maxIPSSPCapabilitiesLength         INTEGER,
    &minLocationNumberLength            INTEGER,
    &maxLocationNumberLength            INTEGER,
    &minMessageContentLength            INTEGER,
    &maxMessageContentLength            INTEGER,
    &minOriginalCalledPartyIDLength     INTEGER,
    &maxOriginalCalledPartyIDLength     INTEGER,
    &minPDPAddressLength                INTEGER,
    &maxPDPAddressLength                INTEGER,
    &minRedirectingPartyIDLength         INTEGER,
    &maxRedirectingPartyIDLength         INTEGER,
    &minScfIDLength                     INTEGER,
    &maxScfIDLength                     INTEGER,
    &minSCIBillingChargingLength         INTEGER,
    &maxSCIBillingChargingLength         INTEGER,
    &minTimeAndTimezoneLength           INTEGER,
    &maxTimeAndTimezoneLength           INTEGER,
    &numOfBCSMEvents                    INTEGER,
    &numOfSMSEvents                     INTEGER,
    &numOfGPRSEvents                    INTEGER,
    &numOfExtensions                     INTEGER,
    &numOfGenericNumbers                 INTEGER,
    &numOfMessageIDs                     INTEGER}

```

```
WITH SYNTAX {
    MINIMUM-FOR-ACCESS-POINT-NAME      &minAccessPointNameLength
    MAXIMUM-FOR-ACCESS-POINT-NAME      &maxAccessPointNameLength
    MINIMUM-FOR-ACH-BILLING-CHARGING    &minAChBillingChargingLength
    MAXIMUM-FOR-ACH-BILLING-CHARGING    &maxAChBillingChargingLength
    MINIMUM-FOR-ATTRIBUTES               &minAttributesLength

```

MAXIMUM-FOR-ATTRIBUTES	&maxAttributesLength
MAXIMUM-FOR-BEARER-CAPABILITY	&maxBearerCapabilityLength
MINIMUM-FOR-CALLED-PARTY-BCD-NUMBER	&minCalledPartyBCDNumberLength
MAXIMUM-FOR-CALLED-PARTY-BCD-NUMBER	&maxCalledPartyBCDNumberLength
MINIMUM-FOR-CALLED-PARTY-NUMBER	&minCalledPartyNumberLength
MAXIMUM-FOR-CALLED-PARTY-NUMBER	&maxCalledPartyNumberLength
MINIMUM-FOR-CALLING-PARTY-NUMBER	&minCallingPartyNumberLength
MAXIMUM-FOR-CALLING-PARTY-NUMBER	&maxCallingPartyNumberLength
MINIMUM-FOR-CALL-RESULT	&minCallResultLength
MAXIMUM-FOR-CALL-RESULT	&maxCallResultLength
MINIMUM-FOR-CARRIER	&minCarrierLength
MAXIMUM-FOR-CARRIER	&maxCarrierLength
MINIMUM-FOR-CAUSE	&minCauseLength
MAXIMUM-FOR-CAUSE	&maxCauseLength
<del>MINIMUM-FOR-COMPONENT</del>	<del>&amp;minComponentLength</del>
<del>MAXIMUM-FOR-COMPONENT</del>	<del>&amp;maxComponentLength</del>
MINIMUM-FOR-DIGITS	&minDigitsLength
MAXIMUM-FOR-DIGITS	&maxDigitsLength
MINIMUM-FOR-FCI-BILLING-CHARGING-DATA	&minFCIBillingChargingDataLength
MAXIMUM-FOR-FCI-BILLING-CHARGING-DATA	&maxFCIBillingChargingDataLength
MINIMUM-FOR-FCI-BILLING-CHARGING	&minFCIBillingChargingLength
MAXIMUM-FOR-FCI-BILLING-CHARGING	&maxFCIBillingChargingLength
MINIMUM-FOR-GENERIC-NUMBER	&minGenericNumberLength
MAXIMUM-FOR-GENERIC-NUMBER	&maxGenericNumberLength
MINIMUM-FOR-GPRS-CAUSE-LENGTH	&minGPRSCauseLength
MAXIMUM-FOR-GPRS-CAUSE-LENGTH	&maxGPRSCauseLength
MINIMUM-FOR-IP-SSP-CAPABILITIES	&minIPSSPCapabilitiesLength
MAXIMUM-FOR-IP-SSP-CAPABILITIES	&maxIPSSPCapabilitiesLength
MINIMUM-FOR-LOCATION-NUMBER	&minLocationNumberLength
MAXIMUM-FOR-LOCATION-NUMBER	&maxLocationNumberLength
MINIMUM-FOR-MESSAGE-CONTENT	&minMessageContentLength
MAXIMUM-FOR-MESSAGE-CONTENT	&maxMessageContentLength
MINIMUM-FOR-ORIGINAL-CALLED-PARTY-ID	&minOriginalCalledPartyIDLength
MAXIMUM-FOR-ORIGINAL-CALLED-PARTY-ID	&maxOriginalCalledPartyIDLength
MINIMUM-FOR-PDP-ADDRESS-LENGTH	&minPDPAddressLength
MAXIMUM-FOR-PDP-ADDRESS-LENGTH	&maxPDPAddressLength
MINIMUM-FOR-REDIRECTING-ID	&minRedirectingPartyIDLength
MAXIMUM-FOR-REDIRECTING-ID	&maxRedirectingPartyIDLength
MINIMUM-FOR-GSMSCF-ID	&minScfIDLength
MAXIMUM-FOR-GSMSCF-ID	&maxScfIDLength
MINIMUM-FOR-SCI-BILLING-CHARGING	&minSCIBillingChargingLength
MAXIMUM-FOR-SCI-BILLING-CHARGING	&maxSCIBillingChargingLength
MINIMUM-FOR-TIME-AND-TIMEZONE	&minTimeAndTimezoneLength
MAXIMUM-FOR-TIME-AND-TIMEZONE	&maxTimeAndTimezoneLength
NUM-OF-BCSM-EVENT	&numOfBCSMEvents
NUM-OF-SMS-EVENTS	&numOfSMSEvents
NUM-OF-GPRS-EVENTS	&numOfGPRSEvents
NUM-OF-EXTENSIONS	&numOfExtensions
NUM-OF-GENERIC-NUMBERS	&numOfGenericNumbers
NUM-OF-MESSAGE-IDS	&numOfMessageIDs}

```
cAPSpecificBoundSet PARAMETERS-BOUND ::= {
  MINIMUM-FOR-ACCESS-POINT-NAME 1
  MAXIMUM-FOR-ACCESS-POINT-NAME 100
  MINIMUM-FOR-ACH-BILLING-CHARGING 5
  MAXIMUM-FOR-ACH-BILLING-CHARGING 177
  MINIMUM-FOR-ATTRIBUTES 2
  MAXIMUM-FOR-ATTRIBUTES 10
  MAXIMUM-FOR-BEARER-CAPABILITY 11
  MINIMUM-FOR-CALLED-PARTY-BCD-NUMBER 1
  MAXIMUM-FOR-CALLED-PARTY-BCD-NUMBER 41
  MINIMUM-FOR-CALLED-PARTY-NUMBER 2
  MAXIMUM-FOR-CALLED-PARTY-NUMBER 18
  MINIMUM-FOR-CALLING-PARTY-NUMBER 2
  MAXIMUM-FOR-CALLING-PARTY-NUMBER 10
  MINIMUM-FOR-CALL-RESULT 12
  MAXIMUM-FOR-CALL-RESULT 193
  MINIMUM-FOR-CARRIER 4
  MAXIMUM-FOR-CARRIER 4
  MINIMUM-FOR-CAUSE 2
  MAXIMUM-FOR-CAUSE 32
  MINIMUM-FOR-COMPONENT 1
  MAXIMUM-FOR-COMPONENT 2
  MINIMUM-FOR-DIGITS 2
  MAXIMUM-FOR-DIGITS 16
  MINIMUM-FOR-FCI-BILLING-CHARGING-DATA 1
  MAXIMUM-FOR-FCI-BILLING-CHARGING-DATA 160
  MINIMUM-FOR-FCI-BILLING-CHARGING 5
```

MAXIMUM-FOR-FCI-BILLING-CHARGING	225
MINIMUM-FOR-GENERIC-NUMBER	3
MAXIMUM-FOR-GENERIC-NUMBER	11
MINIMUM-FOR-GPRS-CAUSE-LENGTH	1
MAXIMUM-FOR-GPRS-CAUSE-LENGTH	1
MINIMUM-FOR-IP-SSP-CAPABILITIES	1
MAXIMUM-FOR-IP-SSP-CAPABILITIES	4
MINIMUM-FOR-LOCATION-NUMBER	2
MAXIMUM-FOR-LOCATION-NUMBER	10
MINIMUM-FOR-MESSAGE-CONTENT	1
MAXIMUM-FOR-MESSAGE-CONTENT	127
MINIMUM-FOR-ORIGINAL-CALLED-PARTY-ID	2
MAXIMUM-FOR-ORIGINAL-CALLED-PARTY-ID	10
MINIMUM-FOR-PDP-ADDRESS-LENGTH	1
MAXIMUM-FOR-PDP-ADDRESS-LENGTH	63
MINIMUM-FOR-REDIRECTING-ID	2
MAXIMUM-FOR-REDIRECTING-ID	10
MINIMUM-FOR-GSMSCF-ID	2
MAXIMUM-FOR-GSMSCF-ID	10
MINIMUM-FOR-SCI-BILLING-CHARGING	4
MAXIMUM-FOR-SCI-BILLING-CHARGING	124
MINIMUM-FOR-TIME-AND-TIMEZONE	8
MAXIMUM-FOR-TIME-AND-TIMEZONE	8
NUM-OF-BCSM-EVENT	10
NUM-OF-SMS-EVENTS	10
NUM-OF-GPRS-EVENTS	10
NUM-OF-EXTENSIONS	10
NUM-OF-GENERIC-NUMBERS	5
NUM-OF-MESSAGE-IDS	16}

END

## 5.6 Object Identifiers (IDs)

CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)  
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

DEFINITIONS ::= BEGIN

...

```

-- gsmSSF/gsmSCF Operation Packages
id-package-scfActivation OBJECT IDENTIFIER ::= {id-package 11}
id-package-gsmSRF-scfActivationOfAssist OBJECT IDENTIFIER ::= {id-package 15}
id-package-assistConnectionEstablishment OBJECT IDENTIFIER ::= {id-package 16}
id-package-genericDisconnectResource OBJECT IDENTIFIER ::= {id-package 17}
id-package-nonAssistedConnectionEstablishment OBJECT IDENTIFIER ::= {id-package 18}
id-package-connect OBJECT IDENTIFIER ::= {id-package 19}
id-package-callHandling OBJECT IDENTIFIER ::= {id-packageE 20}
id-package-bcsmEventHandling OBJECT IDENTIFIER ::= {id-package 21}
id-package-chargingEventHandling OBJECT IDENTIFIER ::= {id-package 23}
id-package-ssfCallProcessing OBJECT IDENTIFIER ::= {id-packageE 24}
id-package-scfCallInitiation OBJECT IDENTIFIER ::= {id-package 25}
id-package-timer OBJECT IDENTIFIER ::= {id-package 26}
id-package-billing OBJECT IDENTIFIER ::= {id-package 27}
id-package-charging OBJECT IDENTIFIER ::= {id-package 28}
id-package-trafficManagement OBJECT IDENTIFIER ::= {id-package 29}
id-package-callReport OBJECT IDENTIFIER ::= {id-package 32}
id-package-signallingControl OBJECT IDENTIFIER ::= {id-package 33}
id-package-activityTest OBJECT IDENTIFIER ::= {id-package 34}
id-package-cancel OBJECT IDENTIFIER ::= {id-packageE 36}
id-package-cphResponse OBJECT IDENTIFIER ::= {id-package 37}
id-package-exceptionInform OBJECT IDENTIFIER ::= {id-package 38}

```

...

END

— Next modified section —
---------------------------

## 6.1 gsmSSF/CCF - gsmSCF Interface

### 6.1.1 Operations and arguments

CAP-gsmSSF-gsmSCF-ops-args {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1) modules(3) cap-gsmSSF-gsmSCF-ops-args(101) version4(3)}

DEFINITIONS IMPLICIT TAGS ::= BEGIN

...

```

AChBillingChargingCharacteristics {},
AdditionalCallingPartyNumber {},
AlertingPattern,
AssistingSSPIPRoutingAddress {},
BCSMEvent,
BCSM-Failure,
BearerCapability {},
CalledPartyNumber {},
CalledPartyBCDNumber {},
CallingPartyNumber {},
CallResult {},
CallSegmentToCancel,
CallSegmentFailure,
Carrier,
Cause {},
CGEncountered,
ChargeNumber {},
ControlType,
CorrelationID {},
DestinationRoutingAddress {},
EventSpecificChargingInformation {},
EventSpecificInformationBCSM {},
EventTypeBCSM,
EventTypeChargingPLMN,
Extensions {},
FCIBillingChargingCharacteristics {},
GapCriteria {},
GapIndicators,
GapTreatment,
GenericNumbers {},
InvokeID,
IPRoutingAddress {},
IPSSPCapabilities {},
leg1,
LegOrCallSegment {},
LocationNumber {},
MonitorMode,
NAOLIInfo,
OCISIAplicable,
OriginalCalledPartyID {},
ReceivingSideID,
RedirectingPartyID {},
RequestedInformationList {},
RequestedInformationTypeList,
ScfID {},
SCIBillingChargingCharacteristics {},
SendingSideID,
ServiceInteractionIndicatorsTwo,
TimeAndTimezone {},
TimerID,
TimerValue

```

FROM CAP-datatypes datatypes

...

```

eventNotificationCharging {PARAMETERS-BOUND : bound} OPERATION ::= {
  ARGUMENT EventNotificationChargingArg { bound}
  RETURN RESULT FALSE
  ALWAYS RESPONDS FALSE
  CODE opcode-eventNotificationCharging}
Direction: gsmSSF -> gsmSCF, Timer: Tene

```

```


-- This operation is used by the gsmSSF to report to the gsmSCF the occurrence of a
-- specific charging event type as previously requested by the gsmSCF in a
-- RequestNotificationChargingEvent operation.

EventNotificationChargingArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {

-- EventSpecificChargingInformation [1] EventSpecificChargingInformation{ bound},
-- legID [2] LegID OPTIONAL,
-- extensions [3] Extensions {bound} OPTIONAL,
-- ...
-- }

...

requestNotificationChargingEvent {PARAMETERS-BOUND : bound} OPERATION ::= {

-- ARGUMENT RequestNotificationChargingEventArg {bound}
-- RETURN RESULT FALSE
-- ERRORS {missingParameter |
-- parameterOutOfRange |
-- systemFailure |
-- taskRefused |
-- unexpectedComponentSequence |
-- unexpectedDataValue |
-- unexpectedParameter |
-- unknownLegId}
-- CODE opcode-requestNotificationChargingEvent}
-- Direction: gsmSCF -> gsmSSF, Timer: Trnc
-- This operation is used by the gsmSCF to instruct the gsmSSF on how to manage the charging events
-- which are received from other FEs and not under control of the service logic instance.

RequestNotificationChargingEventArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {

-- EventTypeChargingPLMN [0] EventTypeChargingPLMN {bound},
-- monitorMode [1] MonitorMode,
-- legID [2] LegID OPTIONAL,
-- extensions [3] Extensions {bound} OPTIONAL,
-- ...
-- }
-- This argument indicates the charging event type and the corresponding monitor mode and LegID.

...

END


```

— Next modified section —

## 6.1.2 gsmSSF/gsmSCF packages, contracts and ACs

### 6.1.2.1 gsmSSF/gsmSCF ASN.1 module

```

CAP-gsmSSF-gsmSCF-pkgs-contracts-acsc {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-gsmSSF-gsmSCF-pkgs-contracts-acsc(102) version4(3)}

```

```

DEFINITIONS ::= BEGIN

```

```

-- This module specifies the Operation Packages, Contracts, Application Contexts
-- and Abstract Syntaxes used for the gsmSSF - gsmSCF interface, for the control of
-- circuit switched calls.

```

```

-- The table in subclause 2.1 lists the specifications that contain the modules
-- that are used by CAP.

```

```

IMPORTS

```

```

...

```

```

    activityTest,
    applyCharging {},
    applyChargingReport {},
    assistRequestInstructions {},
    callGap {},
    callInformationReport {},
    callInformationRequest {},
    cancel,
    connect {},

```

```

    connectToResource {},
    continue,
    continueWithArgument {},
    disconnectForwardConnection,
    disconnectForwardConnectionWithArgument {},
    disconnectLeg {},
    entity Released {},
    establishTemporaryConnection {},
eventNotificationCharging {},
    eventReportBCSM {},
    furnishChargingInformation {},
    initialDP {},
    initiateCallAttempt {},
    moveLeg {},
    playTone {}
    releaseCall {},
requestNotificationChargingEvent {},
    requestReportBCSMEvent {},
    resetTimer {},
    sendChargingInformation {},
    splitLeg {}
FROM CAP-gsmSSF-gsmSCF-ops-args gsmSSF-gsmSCF-Operations

    playAnnouncement {},
    promptAndCollectUserInformation {},
    specializedResourceReport
FROM CAP-gsmSCF-gsmSRF-ops-args gsmSCF-gsmSRF-Operations

    specializedResourceControlPackage {}
FROM CAP-gsmSCF-gsmSRF-pkgs-contracts-acs gsmSCF-gsmSRF-Protocol

    id-ac-CAP-gsmSSF-scfGenericAC,
    id-ac-CAP-gsmSSF-scfAssistHandoffAC,
    id-ac-CAP-scf-gsmSSFGenericAC,
    id-CAPSsfToScfGeneric,
    id-CAPAssistHandoffssfToScf,
    id-as-gsmSSF-scfGenericAS,
    id-as-assistHandoff-gsmSSF-scfAS,
    id-package-scfActivation,
    id-package-gsmSRF-scfActivationOfAssist,
    id-package-assistConnectionEstablishment,
    id-package-genericDisconnectResource,
    id-package-nonAssistedConnectionEstablishment,
    id-package-connect,
    id-package-callHandling,
    id-package-bcsmEventHandling,
id-package-chargingEventHandling,
    id-package-ssfCallProcessing,
    id-package-scfCallInitiation,
    id-package-timer,
    id-package-billing,
    id-package-charging,
    id-package-trafficManagement,
    id-package-callReport,
    id-package-signallingControl,
    id-package-activityTest,
    id-package-cancel,
    id-package-cphResponse,
    id-package-exceptionInform,
    classes,
    ros-InformationObjects,
    tc-Messages,
    tc-NotationExtensions,
    gsmSSF-gsmSCF-Operations,
    gsmSCF-gsmSRF-Operations,
    gsmSCF-gsmSRF-Protocol
FROM CAP-object-identifiers {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
umts-network(1) modules(3) cap-object-identifiers(100) version4(3)}

;

...

-- Contracts

capSsfToScfGeneric CONTRACT ::= {
-- dialogue initiated by gsmSSF with InitialDP Operation
    INITIATOR CONSUMER OF {exceptionInformPackage {cAPSpecificBoundSet} |

```



```

RESPONDER CONSUMER OF
    scfActivationPackage {cAPSpecificBoundSet}}
    {activityTestPackage |
    assistConnectionEstablishmentPackage {cAPSpecificBoundSet} |
    bcsmEventHandlingPackage {cAPSpecificBoundSet} |
    billingPackage {cAPSpecificBoundSet} |
    callHandlingPackage {cAPSpecificBoundSet} |
    callReportPackage {cAPSpecificBoundSet} |
    cancelPackage |
chargingEventHandlingPackage {cAPSpecificBoundSet} |
    chargingPackage {cAPSpecificBoundSet} |
    connectPackage {cAPSpecificBoundSet} |
    cphResponsePackage {cAPSpecificBoundSet} |
    genericDisconnectResourcePackage {cAPSpecificBoundSet} |
    nonAssistedConnectionEstablishmentPackage {cAPSpecificBoundSet} |
    signallingControlPackage {cAPSpecificBoundSet} |
    specializedResourceControlPackage {cAPSpecificBoundSet} |
    ssfCallProcessingPackage {cAPSpecificBoundSet} |
    timerPackage {cAPSpecificBoundSet} |
    trafficManagementPackage {cAPSpecificBoundSet}
    scfCallInitiationPackage {cAPSpecificBoundSet}}
ID
    id-CAPSsfToScfGeneric}

...
-- Operation Packages

chargingEventHandlingPackage {PARAMETERS BOUND : bound} OPERATION PACKAGE ::= {
CONSUMER INVOKES {requestNotificationChargingEvent {bound}}
SUPPLIER INVOKES {eventNotificationCharging {bound}}
ID id-package-chargingEventHandling}

...
-- Abstract Syntaxes

gsmSSF-scfGenericAbstractSyntax ABSTRACT-SYNTAX ::= {
    GenericSSF-gsmSCF-PDUs
    IDENTIFIED BY id-as-gsmSSF-scfGenericAS}

GenericSSF-gsmSCF-PDUs ::= TCMMessage {{SsfToScfGenericInvokable},
                                         {SsfToScfGenericReturnable}}

SsfToScfGenericInvokable OPERATION ::= {
    activityTest |
    applyCharging {cAPSpecificBoundSet} |
    applyChargingReport {cAPSpecificBoundSet} |
    callInformationReport {cAPSpecificBoundSet} |
    callInformationRequest {cAPSpecificBoundSet} |
    cancel |
    connect {cAPSpecificBoundSet} |
    continueWithArgument {cAPSpecificBoundSet} |
    connectToResource {cAPSpecificBoundSet} |
    disconnectForwardConnection |
    disconnectForwardConnectionWithArgument {cAPSpecificBoundSet} |
    disconnectLeg {cAPSpecificBoundSet} |
    entityReleased {cAPSpecificBoundSet} |
    establishTemporaryConnection {cAPSpecificBoundSet} |
eventNotificationCharging {cAPSpecificBoundSet} |
    eventReportBCSM {cAPSpecificBoundSet} |
    furnishChargingInformation {cAPSpecificBoundSet} |
    initialDP {cAPSpecificBoundSet} |
    initiateCallAttempt {cAPSpecificBoundSet} |
    moveLeg {cAPSpecificBoundSet} |
    releaseCall {cAPSpecificBoundSet} |
requestNotificationChargingEvent {cAPSpecificBoundSet} |
    requestReportBCSMEvent {cAPSpecificBoundSet} |
    resetTimer {cAPSpecificBoundSet} |
    sendChargingInformation {cAPSpecificBoundSet} |
    splitLeg {cAPSpecificBoundSet} |
    playAnnouncement {cAPSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSpecificBoundSet} |
    specializedResourceReport
}

SsfToScfGenericReturnable OPERATION ::= {
    activityTest |
    applyCharging {cAPSpecificBoundSet} |
    applyChargingReport {cAPSpecificBoundSet} |
    callGap {cAPSpecificBoundSet} |

```

```

    callInformationRequest {cAPSSpecificBoundSet} |
    cancel |
    connect {cAPSSpecificBoundSet} |
    connectToResource {cAPSSpecificBoundSet} |
    continue |
    continueWithArgument {cAPSSpecificBoundSet} |
    disconnectForwardConnection |
    disconnectForwardConnectionWithArgument {cAPSSpecificBoundSet} |
    disconnectLeg {cAPSSpecificBoundSet} |
    entityReleased {cAPSSpecificBoundSet} |
    establishTemporaryConnection {cAPSSpecificBoundSet} |
    furnishChargingInformation {cAPSSpecificBoundSet} |
    initialDP {cAPSSpecificBoundSet} |
    initiateCallAttempt {cAPSSpecificBoundSet} |
    moveLeg {cAPSSpecificBoundSet} |
    releaseCall {cAPSSpecificBoundSet} |
    requestReportBCSMEEvent {cAPSSpecificBoundSet} |
    resetTimer {cAPSSpecificBoundSet} |
    sendChargingInformation {cAPSSpecificBoundSet} |
    splitLeg {cAPSSpecificBoundSet} |
    playAnnouncement {cAPSSpecificBoundSet} |
    promptAndCollectUserInformation {cAPSSpecificBoundSet}
  }

assistHandoff-gsmSSF-scfAbstractSyntax ABSTRACT-SYNTAX ::= {
  AssistHandoffssf-gsmSCF-PDUs
  IDENTIFIED BY id-as-assistHandoff-gsmSSF-scfAS}

AssistHandoffssf-gsmSCF-PDUs ::= TCMMessage {{AssistHandoffssfToScfInvokable},
  {AssistHandoffssfToScfReturnable}}

AssistHandoffssfToScfInvokable OPERATION ::= {
  activityTest |
  assistRequestInstructions {cAPSSpecificBoundSet} |
  cancel |
  connectToResource {cAPSSpecificBoundSet} |
  disconnectForwardConnection |
  disconnectForwardConnectionWithArgument {cAPSSpecificBoundSet} |
  playAnnouncement {cAPSSpecificBoundSet} |
  promptAndCollectUserInformation {cAPSSpecificBoundSet} |
  resetTimer {cAPSSpecificBoundSet} |
  specializedResourceReport
}

AssistHandoffssfToScfReturnable OPERATION ::= {
  activityTest |
  assistRequestInstructions {cAPSSpecificBoundSet} |
  cancel |
  connectToResource {cAPSSpecificBoundSet} |
  disconnectForwardConnection |
  disconnectForwardConnectionWithArgument {cAPSSpecificBoundSet} |
  playAnnouncement {cAPSSpecificBoundSet} |
  promptAndCollectUserInformation {cAPSSpecificBoundSet} |
  resetTimer {cAPSSpecificBoundSet}
}

scf-gsmSSFGenericAbstractSyntax ABSTRACT-SYNTAX ::= {
  GenericSCF-gsmSSF-PDUs
  IDENTIFIED BY id-as-scf-gsmSSFGenericAS}

GenericSCF-gsmSSF-PDUs ::= TCMMessage {{ScfToSsfGenericInvokable}, {ScfToSsfGenericReturnable}}

ScfToSsfGenericInvokable OPERATION ::= {
  activityTest |
  applyCharging {cAPSSpecificBoundSet} |
  applyChargingReport {cAPSSpecificBoundSet} |
  callInformationRequest {cAPSSpecificBoundSet} |
  cancel |
  connect {cAPSSpecificBoundSet} |
  connectToResource {cAPSSpecificBoundSet} |
  continue |
  continueWithArgument {cAPSSpecificBoundSet} |
  disconnectForwardConnection {cAPSSpecificBoundSet} |
  disconnectForwardConnectionWithArgument {cAPSSpecificBoundSet} |
  disconnectLeg {cAPSSpecificBoundSet} |
  establishTemporaryConnection {cAPSSpecificBoundSet} |
  furnishChargingInformation {cAPSSpecificBoundSet} |
  initiateCallAttempt {cAPSSpecificBoundSet} |

```

```

moveLeg {cAPSSpecificBoundSet} |
playTone {cAPSSpecificBoundSet} |
releaseCall {cAPSSpecificBoundSet} |
requestReportBCSMEEvent {cAPSSpecificBoundSet} |
resetTimer {cAPSSpecificBoundSet} |
sendChargingInformation {cAPSSpecificBoundSet} |
splitLeg {cAPSSpecificBoundSet} |
playAnnouncement {cAPSSpecificBoundSet} |
promptAndCollectUserInformation {cAPSSpecificBoundSet}
}

```

```

ScfToSsfGenericReturnable OPERATION ::= {
  activityTest |
  applyCharging {cAPSSpecificBoundSet} |
  applyChargingReport {cAPSSpecificBoundSet} |
  callInformationReport {cAPSSpecificBoundSet} |
  callInformationRequest {cAPSSpecificBoundSet} |
  cancel |
  connect {cAPSSpecificBoundSet} |
  connectToResource {cAPSSpecificBoundSet} |
  disconnectForwardConnection |
  disconnectForwardConnectionWithArgument {cAPSSpecificBoundSet} |
  disconnectLeg {cAPSSpecificBoundSet} |
  entityReleased {cAPSSpecificBoundSet} |
  establishTemporaryConnection {cAPSSpecificBoundSet} |
  eventReportBCSM {cAPSSpecificBoundSet} |
  furnishChargingInformation {cAPSSpecificBoundSet} |
  initiateCallAttempt {cAPSSpecificBoundSet} |
  moveLeg {cAPSSpecificBoundSet} |
  requestReportBCSMEEvent {cAPSSpecificBoundSet} |
  resetTimer {cAPSSpecificBoundSet} |
  sendChargingInformation {cAPSSpecificBoundSet} |
  splitLeg {cAPSSpecificBoundSet} |
  playAnnouncement {cAPSSpecificBoundSet} |
  promptAndCollectUserInformation {cAPSSpecificBoundSet} |
  specializedResourceReport
}

```

END

## — Next modified section —

## 11.18—EventNotificationCharging procedure

### 11.18.1—General Description

The gsmSSF uses this operation to report to the gsmSCF the occurrence of a specific charging event type as requested by the gsmSCF using the RequestNotificationChargingEvent operation. As several charging events may occur during a connection configuration, the possibility exists for the EventNotificationCharging operation to be invoked on multiple occasions. For each connection configuration, the EventNotificationCharging operation may be used several times.

#### 11.18.1.1—Parameters

##### —eventSpecificChargingInformation:

This parameter contains charging related information specific to the event. This parameter is a choice between four lists of information.

##### —InfoChargeUnitsTotal:

This parameter contains the accumulated charge units which have been monitored. This parameter is a list of the following information:

##### —reportingConditionUnits:

This parameter contains the reporting condition. This parameter shall be the copy of the corresponding parameter received in Request Notification Charging. This parameter shall contain one of the following information:

~~-endOfConnection:~~

~~This parameter indicates that the charge units is being reported at the end of connection.~~

~~-thresholdCounterValue:~~

~~This parameter indicates that the charge units is being reported after exceeding or equalling a threshold.~~

~~-chargeUnits:~~

~~This parameter contains the accumulated charge units which have been monitored.~~

~~-infoChargeUnitsComponents:~~

~~In this parameter the gsmSSF shall specify the charge units of various charging components in the PLMN which have been monitored. This is a list of charging components, accumulated charge units of those components along with the corresponding reporting condition.~~

~~-reportingConditionUnits:~~

~~This parameter contains the reporting condition. This parameter shall be the copy of the corresponding parameter received in Request Notification Charging. This parameter shall contain one of the following information.~~

~~-endOfConnection:~~

~~This parameter indicates that the charge units is being reported at the end of connection.~~

~~-thresholdCounterValue:~~

~~This parameter indicates that the charge units is being reported after exceeding or equalling the threshold.~~

~~-chargeUnits:~~

~~This parameter contains the accumulated charge units which have been monitored.~~

~~-monitorComponent:~~

~~This parameter contains the specific charging components which have been monitored.~~

~~———chargesSpecificPLMN:~~

~~This component specifies the PLMN specific charges at the serving MSC determined by the operator based on radio resource utilization, roaming etc.~~

~~———chargesTransitNetwork:~~

~~This component specifies charges at the serving MSC to be levied for utilization of transit network resources.~~

~~-infoEvaluateTotal:~~

~~This parameter contains the net applicable e-values which have been monitored. This is a list of following information.~~

~~-reportingConditionEvaluate:~~

~~This parameter contains the reporting condition. This parameter shall be the copy of the corresponding parameter received in Request Notification Charging. This parameter shall contain the following information.~~

~~-occurrenceOfEvent:~~

~~This parameter shall be the event when the e-values are reported. This may be the first determination of applicable e-values for the call while routing or the occurrence of network tariff switch and the determination of new applicable e-values.~~

~~—valuesAndTsw:~~

~~This parameter contains the e-values and the duration for which these e-values are valid. This parameter is a list of following information.~~

~~—eAIElements:~~

~~This is a set of Charge Advice Information elements, as defined in 3GPP TS 22.024 [2].~~

~~—tariffSwitchInterval:~~

~~This parameter contains the time duration for which the above mentioned e-values are valid.~~

~~—infoEvaluateComponents:~~

~~In this parameter the gsmSSF shall specify the e-values and the tariff switch interval of various charging components in the PLMN which have been monitored. It contains the list of the charging component, applicable e-values for those components which have been monitored along with the corresponding reporting condition.~~

~~—reportingConditionEvaluate:~~

~~This parameter contains the reporting condition. This parameter shall be the copy of the corresponding parameter received in Request Notification Charging. This parameter shall contain the following information.~~

~~—occurrenceOfEvent:~~

~~This parameter shall be the event when the e-values are reported. This may be the first determination of applicable e-values for the call while routing or the occurrence of network tariff switch and the determination of new applicable e-values.~~

~~—valuesAndTsw:~~

~~This parameter contains the e-values and the duration for which these e-values are valid. This parameter is a list of following information.~~

~~—eAIElements:~~

~~This is a set of Charge Advice Information elements, as defined in 3GPP TS 22.024 [2].~~

~~—tariffSwitchInterval:~~

~~This parameter contains the time duration for which the above mentioned e-values are valid.~~

~~—monitorComponent:~~

~~This parameter contains the specific charging component which has been monitored.~~

~~—chargesSpecificPLMN:~~

~~This component specifies the PLMN specific charges at the serving MSC determined by the operator based on radio resource utilization, roaming etc.~~

~~—chargesTransitNetwork:~~

~~This component specifies charges at the serving MSC to be levied for utilization of transit network resources.~~

~~—legID:~~

~~This parameter indicates the leg ID for which the event is monitored.~~

## ~~11.18.2 Invoking entity (gsmSSF)~~

### ~~11.18.2.1 Normal procedure~~

~~gsmSSF preconditions:~~

- ~~(1) A relationship exist between the gsmSCF and the gsmSSF.~~
- ~~(2) A charging event has been detected that is requested by the gsmSCF.~~

~~gsmSSF posteconditions:~~

- ~~(1) No gsmSSF FSM state transition.~~

~~The gsmSSF FSM is in any state except "Idle". This operation is invoked if a charging event has been detected that is requested by the gsmSCF.~~

### ~~11.18.2.2 Error handling~~

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

## ~~11.28 RequestNotificationChargingEvent procedure~~

### ~~11.28.1 General Description~~

~~The gsmSCF uses this operation to instruct the gsmSSF how to manage the charging events which are received from other Functional Entities (FEs) not under the control of the ServiceLogic (SL) instance.~~

#### ~~11.28.1.1 Parameters~~

~~—eventTypeChargingPLMN:~~

~~This parameter indicates the charging event type, ie. the type of charging information to be monitored by the serving MSC and to be reported to the CSE. This parameter is a choice between four lists of information.~~

~~—chargeUnitsTotal:~~

~~This parameter indicates that the accumulated charge units for the call are to be monitored. This parameter is a list of following information.~~

~~—reportingConditionUnits:~~

~~This parameter indicates the charge units are to be reported on the occurrence of one of the following conditions:~~

~~—————endOfConnection:~~

~~This parameter indicates that the charge units are to be reported at the disconnection of the established connection configuration.~~

~~—thresholdCountervalue:~~

~~This parameter indicates that the charge units are to be reported when the accumulated charge units equal or exceed the specified threshold value.~~

~~—chargeUnitsComponents:~~

~~In this parameter CSE shall specify the units of various charging components in the PLMN to be monitored. It contains the list of the charging components to be monitored and the corresponding reporting condition.~~

~~—monitorComponent:~~

This parameter specifies the PLMN charging component to be monitored. It is a choice of

–chargesSpecificPLMN:

This component specifies the PLMN specific charges at the serving MSC determined by the operator based on radio resource utilization, roaming etc.

–chargesTransitNetwork:

This component specifies charges at the serving MSC to be levied for utilization of transit network resources.

–reportingConditionUnits:

This parameter indicates the charge units are to be reported on the occurrence of one of the following conditions

–endOfConnection:

This parameter indicates that the charge units are to be reported at the disconnection of the established connection configuration.

–thresholdCountervalue:

This parameter indicates that the charge units are to be reported when the accumulated charge units equal or exceed the specified threshold value.

–evaluesTotal:

This parameter specifies that the net applicable e-values are to be reported. The serving MSC shall report the currently applicable e-values. It shall also notify the new e-values to CSE whenever applicable e-values change due to event such as tariff switch. It is a list of following information.

–reportingConditionEvalue:

This parameter indicates that the e-values are to be reported on the occurrence of the following conditions

—occuranceOfEvent:

This indicates that the e-values are to be reported at the occurrence of charging event which may be the first determination of applicable e-values for the call while routing or the occurrence of network tariff switch and the determination of new applicable e-values.

–evaluesComponents:

In this parameter CSE may request the e-values corresponding to the various charging components in the PLMN. It contains the list of the component to be monitored and the corresponding reporting condition

–monitorComponent:

This parameter specifies the PLMN charging component to be monitored. It is a choice of following parameters:

–chargesSpecificPLMN:

This component specifies the PLMN specific charges at the serving MSC determined by the operator based on radio resource utilization, roaming etc.

–chargesTransitNetwork:

This component specifies charges at the serving MSC to be levied for utilization of transit network resources.

–reportingConditionEvalue:

This parameter indicates that the e-values are to be reported on the occurrence of any of the following conditions:

~~–occurrenceOfEvent:~~

~~This indicates that the e-values are to be reported at the occurrence of charging event which may be the first determination of applicable e-values for the call while routing or the occurrence of network tariff switch and the determination of new applicable e-values.~~

~~–monitorMode:~~

~~This parameter indicates the monitorMode applicable for the corresponding "eventTypeCharging" parameter. Monitor mode may be "notifyAndContinue" or "transparent".~~

~~The monitor mode "interrupted" is not applicable for the RequestNotificationCharging operation.~~

~~–legID:~~

~~This parameter indicates the leg ID for which the charging event is to be monitored.~~

## 11.28.2 Responding entity (gsmSSF)

### 11.28.2.1 Normal procedure

~~gsmSSF preconditions:~~

- ~~(1)The gsmSSF FSM is in the state "Waiting\_for\_Instructions" or in the state "Monitoring".~~
- ~~(2)A relationship exist between the gsmSCF and the gsmSSF.~~

~~gsmSSF postconditions:~~

- ~~(1)No gsmSSF FSM state transition.~~

~~On receipt of this operation the gsmSSF performs actions to cope with the interactions concerning the charging according the information elements included in the operation.~~

~~In the case that multiple RequestNotificationChargingEvent operations are received for the same connection configuration with the same "eventTypeCharging" and "legID", only the latest received "monitorMode" shall apply.~~

### 11.28.2.2 Error handling

~~Generic error handling for the operation related errors is described in Clause 10 and the TCAP services which are used for reporting operation errors are described in Clause 14.~~

**— End —**



## CHANGE REQUEST

⌘ **23.078 CR 420** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

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

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

<b>Title:</b>	⌘ Clean-up of LocationInformation table for Call_Accepted DP		
<b>Source:</b>	⌘ Alcatel		
<b>Work item code:</b>	⌘ CAMEL4	<b>Date:</b>	⌘ 01/08/2002
<b>Category:</b>	⌘ <b>D</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ Currently there are two tables for the Location Information IE. One table is sufficient.
<b>Summary of change:</b>	⌘ Delete the first table and move "Call_Accepted" to the second table of Location Information.
<b>Consequences if not approved:</b>	⌘ Unclear specifications.

<b>Clauses affected:</b>	⌘ 4.6.1.7 Event Report BCSM						
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test specifications	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	O&M Specifications	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<b>Other comments:</b>	⌘						

— First modified section —

#### 4.6.1.7 Event Report BCSM

##### 4.6.1.7.1 Description

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

##### 4.6.1.7.2 Information Elements

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

If the Event Type BCSM IE contains either O\_Answer or T\_Answer, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Destination Address	M	M	M	M	M	M	This IE specifies the destination address for the call leg. The <i>NatureOfAddress</i> indicator may contain a national-specific value. For some national-specific <i>NatureOfAddress</i> indicator values the length of the digit part of destination address may be zero.
OR	-	C	C	-	-	-	This IE indicates that the call was subject to basic Optimal Routeing as specified in 3GPP TS 23.079 [Error! Reference source not found.].
Forwarded Call	-	M	C	C	-	-	This IE indicates that the call has been subject to a Call Forwarding supplementary service.
Charge Indicator	S	S	S	S	S	S	This IE specifies the value which will be stored in the Call Data Record. See ITU-T Recommendation Q.763 [Error! Reference source not found.].

If the Event Type BCSM IE contains either O\_Mid\_Call or T\_Mid\_Call, then the Event Specific Information BCSM IE contains the following information element:

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

MidCall Info contains the following information elements:

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

If the Event Type BCSM IE contains one of Route\_Select\_Failure, O\_Called\_Party\_Busy, O\_Disconnect or T\_Disconnect, then the Event Specific Information BCSM IE contains the following information element:

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

If the Event Type BCSM IE contains T\_Busy, then the Event Specific Information BCSM IE contains the following information elements:

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

If the Event Type BCSM IE contains T\_No\_Answer, then the Event Specific Information BCSM IE contains the following information elements:

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

If the Event Type BCSM IE contains Call\_Accepted, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Location Information	-	-	-	C	-	-	See subclause <b>Error! Reference source not found.</b>

If the Event Type BCSM IE contains Call\_Accepted, O\_Term\_Seized, O\_Change\_Of\_Position or T\_Change\_Of\_Position, then the Event Specific Information BCSM IE contains the following information elements:

Information element name	MO	MF	MT	VT	NC	NP	Description
Location Information	C	-	-	C	-	-	See subclause <b>Error! Reference source not found.</b>

If the Event Type BCSM IE contains O\_Abandon, then the Event Specific Information BCSM IE contains the following information elements:

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

If the Event Type BCSM IE contains O\_No\_Answer, then the Event Specific Information BCSM IE is not included.

— End —