

Source: SA5 (Telecom Management)
Title: 32.005 CR, "Circuit domain charging enhancements on CAMEL phase 3"
(S5-000307)
Document for: Approval
Agenda Item: 6.5.3

Spec	CR	Phas	Subject	Ca	Versi	Versi	Doc-2nd-
32.005	001	R99	Circuit domain charging enhancements on CAMEL phase 3	B	3.0.0	3.1.0	S5-000307

CHANGE REQUEST No :		001	<i>Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.</i>	
Technical Specification GSM / UMTS:		32.005	Version	3.0.0
For submission to:	SA#8	for approval	X	without presentation ("non-strategic")
<i>list approval meeting # here ↑</i>		for information		with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ME Network
(at least one should be marked with an X)

Work item: CAMEL phase 3 Charging

Source: SA5#12 **Date:** 9 June 2000

Subject: Circuit domain charging enhancements on CAMEL phase 3

Category: <i>(one category and one release only shall be marked with an X)</i>	F Correction	<input type="checkbox"/>	Release:	Phase 2	<input type="checkbox"/>
	A Corresponds to a correction in an earlier release	<input type="checkbox"/>		Release 96	<input type="checkbox"/>
	B Addition of feature	X		Release 97	<input type="checkbox"/>
	C Functional modification of feature	<input type="checkbox"/>		Release 98	<input type="checkbox"/>
	D Editorial modification	<input type="checkbox"/>		Release 99	X
			UMTS	<input type="checkbox"/>	

Reason for change:

CAMEL phase 3 defines FCI operation with append indicator. If append indicator exists, the subsequent FCI information is appended to the previous FCI information. If not, the previous FCI information shall be overwritten. Conditional indicator is also needed to enable post processing system to consolidate valid free format data from sequence of partial records.

CAMEL phase 3 defines CAMEL support for mobile originated SMS (SMS_CSI). The FCI data as well as Default SMS handling and CAMEL SMS modification fields shall be added to SMS-MO record.

CAMEL phase 3 defines the T-BCSM in the VMSC (VT_CSI). Because of that fields associated with CAMEL shall be added to MTC record.

CAMEL phase 3 defines also dialled services (D_CSI), which can be applied in same call with originating CAMEL service.

Clauses affected: A.9, B.2.1, B.2.3, B.2.4, B.2.13, B.2.19, B.3.13

Other specs Affected:	Other releases of same spec	<input type="checkbox"/>	→ List of CRs:	
	Other core specifications	<input type="checkbox"/>	→ List of CRs:	
	MS test specifications / TBRs	<input type="checkbox"/>	→ List of CRs:	
	BSS test specifications	<input type="checkbox"/>	→ List of CRs:	
	O&M specifications	<input type="checkbox"/>	→ List of CRs:	

Other comments:

A.9 Abstract syntax

```
GSM1205-DataTypes { ccitt (0) identified-organization (4) etsi (0) mobileDomain (0) gsm-Operation-
Maintenance (3) gsm-12-05 (5) informationModel (0) asnlModule (2) 1 }
```

```
DEFINITIONS IMPLICIT TAGS ::=
```

```
BEGIN
```

```
-- EXPORTS everything
```

```
IMPORTS
```

```
| ServiceKey, DefaultCallHandling, DefaultSMS-Handling
FROM MAP-MS-DataTypes { ccitt identified-organization (4) etsi(0) mobileDomain (0)
| gsm-Network(1) modules(3) map-MS-DataTypes (11) version653 (653) }
```

```
-----
--
-- CALL AND EVENT RECORDS
--
-----
```

```
MOCallRecord ::= SET
```

```
{
  recordType          [0] CallEventRecordType,
  servedIMSI          [1] IMSI OPTIONAL,
  servedIMEI          [2] IMEI OPTIONAL,
  servedMSISDN        [3] MSISDN OPTIONAL,
  callingNumber       [4] CallingNumber OPTIONAL,
  calledNumber        [5] CalledNumber OPTIONAL,
  translatedNumber    [6] TranslatedNumber OPTIONAL,
  connectedNumber     [7] ConnectedNumber OPTIONAL,
  roamingNumber       [8] RoamingNumber OPTIONAL,
  recordingEntity      [9] RecordingEntity,
  mscIncomingTKGP     [10] TrunkGroup OPTIONAL,
  mscOutgoingTKGP     [11] TrunkGroup OPTIONAL,
  location            [12] LocationAreaAndCell OPTIONAL,
  changeOfLocation    [13] SEQUENCE OF LocationChange OPTIONAL,
  basicService        [14] BasicServiceCode OPTIONAL,
  transparencyIndicator [15] TransparencyInd OPTIONAL,
  changeOfService     [16] SEQUENCE OF ChangeOfService OPTIONAL,
  supplServicesUsed   [17] SEQUENCE OF SuppServiceUsed OPTIONAL,
  aocParameters       [18] AOCParameters OPTIONAL,
  changeOfAOCParams   [19] SEQUENCE OF AOCParmChange OPTIONAL,
  msClassmark         [20] Classmark OPTIONAL,
  changeOfClassmark   [21] ChangeOfClassmark OPTIONAL,
  seizureTime         [22] TimeStamp OPTIONAL,
  answerTime          [23] TimeStamp OPTIONAL,
  releaseTime         [24] TimeStamp OPTIONAL,
  callDuration        [25] CallDuration,
  dataVolume          [26] DataVolume OPTIONAL,
  radioChanRequested [27] RadioChanRequested OPTIONAL,
  radioChanUsed       [28] TrafficChannel OPTIONAL,
  changeOfRadioChan   [29] ChangeOfRadioChannel OPTIONAL,
  causeForTerm        [30] CauseForTerm,
  diagnostics         [31] Diagnostics OPTIONAL,
  callReference       [32] CallReference,
  sequenceNumber      [33] INTEGER OPTIONAL,
  additionalChgInfo   [34] AdditionalChgInfo OPTIONAL,
  recordExtensions    [35] ManagementExtensions OPTIONAL,
  gsm-SCFAddress      [36] Gsm-SCFAddress OPTIONAL,
  serviceKey          [37] ServiceKey OPTIONAL,
  networkCallReference [38] NetworkCallReference OPTIONAL,
  mSCAddress          [39] MSCAddress OPTIONAL,
  cAMELInitCFIndicator [40] CAMELInitCFIndicator OPTIONAL,
  defaultCallHandling [41] DefaultCallHandling OPTIONAL,
  hSCSDChanRequested [42] NumOfHSCSDChanRequested OPTIONAL,
  hSCSDChanAllocated [43] NumOfHSCSDChanAllocated OPTIONAL,
  changeOfHSCSDParms [44] SEQUENCE OF HSCSDParmsChange OPTIONAL,
  fnur               [45] Fnur OPTIONAL,
  aiurRequested       [46] AiurRequested OPTIONAL,
  chanCodingsAcceptable [47] SEQUENCE OF ChannelCoding OPTIONAL,
  chanCodingUsed      [48] ChannelCoding OPTIONAL,
  speechVersionSupported [49] SpeechVersionIdentifier OPTIONAL,
  speechVersionUsed   [50] SpeechVersionIdentifier OPTIONAL,
  numberOfDPENcOUNTERED [51] INTEGER OPTIONAL,
  levelOfCAMELService [52] LevelOfCAMELService OPTIONAL,
  freeFormatData      [53] FreeFormatData OPTIONAL,
  cAMELCallLegInformation [54] SEQUENCE OF CAMELInformation OPTIONAL,
```

<u>freeFormatDataAppend</u>	[55]	BOOLEAN OPTIONAL,
<u>defaultCallHandling_2</u>	[56]	DefaultCallHandling OPTIONAL,
<u>gsm-SCFAddress_2</u>	[57]	Gsm-SCFAddress OPTIONAL,
<u>serviceKey_2</u>	[58]	ServiceKey OPTIONAL,
<u>freeFormatData_2</u>	[59]	FreeFormatData OPTIONAL,
<u>freeFormatDataAppend_2</u>	[60]	BOOLEAN OPTIONAL

```

}

MTCallRecord ::= SET
{
  recordType [0] CallEventRecordType,
  servedIMSI [1] IMSI,
  servedIMEI [2] IMEI OPTIONAL,
  servedMSISDN [3] CalledNumber OPTIONAL,
  callingNumber [4] CallingNumber OPTIONAL,
  connectedNumber [5] ConnectedNumber OPTIONAL,
  recordingEntity [6] RecordingEntity,
  mscIncomingTKGP [7] TrunkGroup OPTIONAL,
  mscOutgoingTKGP [8] TrunkGroup OPTIONAL,
  location [9] LocationAreaAndCell OPTIONAL,
  changeOfLocation [10] SEQUENCE OF LocationChange OPTIONAL,
  basicService [11] BasicServiceCode OPTIONAL,
  transparencyIndicator [12] TransparencyInd OPTIONAL,
  changeOfService [13] SEQUENCE OF ChangeOfService OPTIONAL,
  supplServicesUsed [14] SEQUENCE OF SuppServiceUsed OPTIONAL,
  aocParameters [15] AOCParameters OPTIONAL,
  changeOfAOCParms [16] SEQUENCE OF AOCParmChange OPTIONAL,
  msClassmark [17] Classmark OPTIONAL,
  changeOfClassmark [18] ChangeOfClassmark OPTIONAL,
  seizureTime [19] TimeStamp OPTIONAL,
  answerTime [20] TimeStamp OPTIONAL,
  releaseTime [21] TimeStamp OPTIONAL,
  callDuration [22] CallDuration,
  dataVolume [23] DataVolume OPTIONAL,
  radioChanRequested [24] RadioChanRequested OPTIONAL,
  radioChanUsed [25] TrafficChannel OPTIONAL,
  changeOfRadioChan [26] ChangeOfRadioChannel OPTIONAL,
  causeForTerm [27] CauseForTerm,
  diagnostics [28] Diagnostics OPTIONAL,
  callReference [29] CallReference,
  sequenceNumber [30] INTEGER OPTIONAL,
  additionalChgInfo [31] AdditionalChgInfo OPTIONAL,
  recordExtensions [32] ManagementExtensions OPTIONAL,
  networkCallReference [33] NetworkCallReference OPTIONAL,
  mSCAddress [34] MSCAddress OPTIONAL,
  hSCSDChanRequested [35] NumOfHSCSDChanRequested OPTIONAL,
  hSCSDChanAllocated [36] NumOfHSCSDChanAllocated OPTIONAL,
  changeOfHSCSDParms [37] SEQUENCE OF HSCSDParmsChange OPTIONAL,
  fnur [38] Fnur OPTIONAL,
  aiurRequested [39] AiurRequested OPTIONAL,
  chanCodingsAcceptable [40] SEQUENCE OF ChannelCoding OPTIONAL,
  chanCodingUsed [41] ChannelCoding OPTIONAL,
  speechVersionSupported [42] SpeechVersionIdentifier OPTIONAL,
  speechVersionUsed [43] SpeechVersionIdentifier OPTIONAL,
  gsm-SCFAddress [44] Gsm-SCFAddress OPTIONAL,
  serviceKey [45] ServiceKey OPTIONAL,
  networkCallReference [46] NetworkCallReference OPTIONAL,
  mSCAddress [47] MSCAddress OPTIONAL,
  defaultCallHandling [48] DefaultCallHandling OPTIONAL,
  freeFormatData [49] FreeFormatData OPTIONAL,
  freeFormatDataAppend [50] BOOLEAN OPTIONAL
}

TermCAMELIntRecord ::= SET
{
  recordtype [0] CallEventRecordType,
  servedIMSI [1] IMSI,
  servedMSISDN [2] MSISDN OPTIONAL,
  recordingEntity [3] RecordingEntity,
  interrogationTime [4] TimeStamp,
  destinationRoutingAddress [5] DestinationRoutingAddress,
  gsm-SCFAddress [6] Gsm-SCFAddress,
  serviceKey [7] ServiceKey,
  networkCallReference [8] NetworkCallReference OPTIONAL,
  mSCAddress [9] MSCAddress OPTIONAL,
  defaultCallHandling [10] DefaultCallHandling OPTIONAL,
  recordExtensions [11] ManagementExtensions OPTIONAL,
  calledNumber [12] CalledNumber,
  callingNumber [13] CallingNumber OPTIONAL,
  mscIncomingTKGP [14] TrunkGroup OPTIONAL,
  mscOutgoingTKGP [15] TrunkGroup OPTIONAL,

```

```

seizureTime           [16] TimeStamp OPTIONAL,
answerTime            [17] TimeStamp OPTIONAL,
releaseTime           [18] TimeStamp OPTIONAL,
callDuration          [19] CallDuration,
dataVolume            [20] DataVolume OPTIONAL,
causeForTerm          [21] CauseForTerm,
diagnostics           [22] Diagnostics OPTIONAL,
callReference         [23] CallReference,
sequenceNumber        [24] INTEGER OPTIONAL,
numberOfDPENcountered [25] INTEGER OPTIONAL,
levelOfCAMELService   [26] LevelOfCAMELService OPTIONAL,
freeFormatData        [27] FreeFormatData OPTIONAL,
cAMELCallLegInformation [28] SEQUENCE OF CAMELInformation OPTIONAL,
freeFormatDataAppend  [29] BOOLEAN OPTIONAL
}

```

```

MOSMSRecord ::= SET

```

```

{
  recordType           [0] CallEventRecordType,
  servedIMSI           [1] IMSI,
  servedIMEI           [2] IMEI OPTIONAL,
  servedMSISDN         [3] MSISDN OPTIONAL,
  msClassmark          [4] Classmark,
  serviceCentre        [5] AddressString,
  recordingEntity       [6] RecordingEntity,
  location             [7] LocationAreaAndCell OPTIONAL,
  messageReference     [8] MessageReference,
  originationTime      [9] TimeStamp,
  smsResult            [10] SMSResult OPTIONAL,
  recordExtensions    [11] ManagementExtensions OPTIONAL,
  destinationNumber    [12] CalledNumber OPTIONAL,
  cAMELSMSInformation  [13] CAMELSMSInformation OPTIONAL
}

```

```

-----
--
-- COMMON DATA TYPES
--
-----

```

```

AOCParameters ::= SEQUENCE

```

```

{
  --
  -- See TS 22.024.
  --
  e1 [1] EParameter OPTIONAL,
  e2 [2] EParameter OPTIONAL,
  e3 [3] EParameter OPTIONAL,
  e4 [4] EParameter OPTIONAL,
  e5 [5] EParameter OPTIONAL,
  e6 [6] EParameter OPTIONAL,
  e7 [7] EParameter OPTIONAL
}

```

```

EParameter ::= INTEGER (0..1023)

```

```

--
-- Coded according to TS 22.024 and TS 24.080
--

```

```

FreeFormatData ::= OCTET STRING (SIZE(1..160_40))

```

```

--
-- Free formatted data as sent in the FCI message
-- See TS 29.078 GSM-09-78
--

```

```

CAMELInformation ::= SET

```

```

{
  cAMELDestinationNumber [1] CAMELDestinationNumber OPTIONAL,
  connectedNumber        [2] ConnectedNumber OPTIONAL,
  roamingNumber          [3] RoamingNumber OPTIONAL,
  mscOutgoingTKGP        [4] TrunkGroup OPTIONAL,
  seizureTime            [5] TimeStamp OPTIONAL,
  answerTime             [6] TimeStamp OPTIONAL,
  releaseTime            [7] TimeStamp OPTIONAL,
  callDuration           [8] CallDuration OPTIONAL,
  dataVolume             [9] DataVolume OPTIONAL,
  cAMELInitCFIndicator   [10] CAMELInitCFIndicator OPTIONAL,
  causeForTerm           [11] CauseForTerm OPTIONAL,
  cAMELModification      [12] ChangedParameters OPTIONAL,
}

```

```

    freeFormatData      [13] FreeFormatData OPTIONAL,
    diagnostics         [14] Diagnostics OPTIONAL,
    freeFormatDataAppend [15] BOOLEAN OPTIONAL,
    freeFormatData_2    [16] FreeFormatData OPTIONAL,
    freeFormatDataAppend_2 [17] BOOLEAN OPTIONAL
}

CAMELSMSInformation ::= SET
{
    gsm-SCFAddress      [1] Gsm-SCFAddress OPTIONAL,
    serviceKey          [2] ServiceKey OPTIONAL,
    defaultSMSHandling [3] DefaultSMS-Handling OPTIONAL,
    freeFormatData      [4] FreeFormatData OPTIONAL,
    CallingPartyNumber  [5] CallingNumber OPTIONAL,
    DestinationSubscriberNumber [6] CalledNumber OPTIONAL,
    cAMELSMSCAddress    [7] AddressString OPTIONAL
}

```

Annex B (normative): Call and event records

B.1.7 CAMEL services

CAMEL service can be activated for originating, forwarded and terminated calls and originating SMS. Several fields describing CAMEL subscription and free format data are recorded to appropriate CDR. For originating and forwarded calls two different CAMEL services can be active and part of stored information is different Originating service and Dialed service defined in O-CSI and D-CSI). If two services are active, the Originating CAMEL service information is stored in fields without ' 2' suffix and Dialed CAMEL service information in corresponding fields with ' 2' suffix. If only one CAMEL service is active, either Originating or Dialed service, then fields without ' 2' suffix are used. CAMEL fields describing usage level of service, CAMEL modified parameters and CAMEL initiated call forwarding include information for one call leg including impacts on all CAMEL services.

CAMEL Terminating service in the VPLMN defined in VT_CSI affect the corresponding incoming CAMEL call leg part of the relevant record.

Annex B (normative): Call and event records

B.2 Record contents

The following tables describe the contents of each of the call and event records defined in the present document. Each table contains the name of the field, a key indicating whether or not the field is mandatory, and a description of the contents.

The key field has the following meaning:

- M** This field is mandatory and always present. Any exceptions to this rule are explicitly described.
- C** This field is only available under certain conditions. If available the field is present. The conditions under which the field is available are individually described.
- O** This field is optional and configurable either via additional TMN management functions or manufacturer specific means. For the avoidance of doubt, optional does not mean that the parameter is not supported by the network element. Equipment manufacturers shall be capable of providing all of these fields in order to claim conformance with the present document.

B.2.1 Mobile originated call attempt

If the generation of these records is enabled then an MOC record shall be created for each outgoing call attempt made by a mobile station. These MOC records shall be produced in the originating MSC.

Table B.1: MOC record

Field		Description
Record Type	M	Mobile originated.
Served IMSI	M	IMSI of the calling party.
Served IMEI	C	IMEI of the calling ME, if available.
Served MSISDN	O	The primary MSISDN of the calling party.
Called Number	M	The address of the called party e.g. the number dialed by the calling sub.
Translated Number	O	The called number after digit translation within the MSC (if applicable)
Connected Number	O	The number of the connected party if different to the Called Number
Roaming Number	O	The Mobile Station Roaming Number employed to route this connection, if applicable.
Recording Entity	M	The E.164 number of the visited MSC producing the record.
Incoming TKGP	O	The MSC trunk group on which the call originated , usually from the BSS
Outgoing TKGP	O	The trunk group on which the call left the MSC
Location	M	The identity of the cell in which the call originated including the location area code.
Change of Location	O	A list of changes in Location Area Code / Cell Id. each time-stamped.
Basic service	M	Bearer or teleservice employed.
Transparency Indicator	C	Only provided for those teleservices which may be employed in both transparent and non-transparent mode.
ChangeOfService	O	A list of changes of basic service during a connection each time-stamped.
Supp. Services	C	Supplementary services invoked as a result of this connection.
AOC Parameters	O	The charge advice parameters sent to the MS on call set-up
Change of AOC Params	O	New AOC parameters sent to the MS e.g. as a result of a tariff switch over, including the time at which the new set was applied.
MS Classmark	M	The mobile station classmark employed on call set-up.
Change of Classmark	O	A list of changes to the classmark during the connection each time-stamped
Event time stamps:	C C O	Seizure of incoming traffic channel (for unsuccessful call attempts) Answer (for successful calls) Release of traffic channel
Call duration	M	The chargeable duration of the connection for successful calls, the holding time for call attempts.
Radio Chan. Requested	O	The type of radio traffic channel (full / half etc.) requested by the MS.
Radio Chan. Used	M	The type of radio channel actually used (full or half rate).
Change of Rad. Chan.	O	A list of changes each time stamped
Cause for termination	M	The reason for the release of the connection.
Diagnostics	O	A more detailed reason for the release of the connection.
Data volume	C	The number of data segments transmitted if available at the MSC
Sequence no.	C	Partial record sequence number, only present in case of partial records.
Call reference	M	A local identifier distinguishing between transactions on the same MS
Additional Chg. Info	O	Charge/no charge indicator and additional charging parameters
Record extensions	O	A set of network/ manufacturer specific extensions to the record.
GsmSCF address	C	Identifies the CAMEL server serving the subscriber.
Service key	C	The CAMEL service logic to be applied.
Network call reference	C	An identifier to correlate transactions on the same call taking place in different network nodes, shall be present if CAMEL is applied.
MSC Address	C	This field contains the E.164 number assigned to the MSC that generated the network call reference.
Default call handling	O	Indicates whether or not a CAMEL call encountered default call handling. This field shall be present only if default call handling has been applied.
Number of HSCSD Channels Requested	C	The maximum number of HSCSD channels requested as received from the MS at call set-up
Number of HSCSD Channels Allocated	C	The number of HSCSD channels allocated to the MS at call set-up
Change of HSCSD Parameters	C	A list of network or user initiated changes of number of HSCSD channels during a connection each timestamped. Shall only be present in case of an HSCSD call, if the basic HSCSD parameters are modified due the user or network initiated modification procedure.
Fixed Network User Rate	O	May be present for HSCSD connections.
Air Interface User Rate Requested	C	The total Air Interface User Rate Requested by the MS at call setup. Shall only be present for non-transparent HSCSD connections.
		(continued)

Table B.1 (concluded): MOC record

Field		Description
Channel Coding Accepted	C	A list of the traffic channels codings accepted by the MS. Shall only be present for HSCSD connections.
Channel Coding Used	C	The traffic channels codings negotiated between the MS and the network at call setup. Shall only be present for HSCSD connections.
Speech Version Used	O	Speech version used for that call
Speech Version Supported	O	Speech version supported by the MS with highest priority indicated by MS
Number of DP encountered	O	Number that counts how often armed detection points (TDP and EDP) were encountered.
Level of CAMEL service	O	Indicator for the complexity of the CAMEL feature used.
Free format Data	C	This field contains data sent by the gsmSCF in the FCI message(s). The data can be sent either in one FCI message or several FCI messages with <u>append indicator</u> .
CAMEL call leg information	C	Set of CAMEL information IEs. Each of these IEs contains information related to one outgoing CAMEL call leg.
Free format data <u>append indicator</u>	<u>C</u>	Indicator if free format data from this CDR is to be appended to free format data in <u>previous partial CDR</u> .
<u>Default call handling 2</u>	<u>O</u>	<u>Indicates whether or not a CAMEL call encountered default call handling for 2nd service such as dialled service. This field shall be present only if default call handling has been applied.</u>
<u>GsmSCF address 2</u>	<u>C</u>	<u>Identifies the CAMEL server serving the subscriber for 2nd service such as dialled service.</u>
<u>Service key 2</u>	<u>C</u>	<u>The CAMEL service logic to be applied for 2nd service such as dialled service.</u>
<u>Free format Data 2</u>	<u>C</u>	<u>This field contains data sent by the gsmSCF in the FCI message(s) for 2nd service such as dialled service. The data can be sent either in one FCI message or several FCI messages with <u>append indicator</u>.</u>
<u>Free format data <u>append indicator 2</u></u>	<u>C</u>	<u>Indicator if free format data for 2nd service from this CDR is to be appended to free format data in <u>previous partial CDR</u>.</u>

B.2.3 Mobile originated call forwarding attempt

If the generation of MOC records is enabled then, In case of call forwarding, the forwarded-leg of the call shall also result in the production of an MOC record in the MSC that forwards the call (see the example scenarios in subclause B.4.6 and B.4.7).

Table B.3: MOC, call forwarding record

Field		Description
Record Type	M	Mobile originated.
Served IMSI	M	IMSI of the calling party.
Served MSISDN	O	The MSISDN of the forwarding party.
Calling Number	O	The address of the calling party.
Called Number	M	The address of the "forwarded-to" party.
Translated Number	O	The called number after digit translation within the MSC (if applicable)
Connected Number	O	The number of the connected party if different to the Called Number
Roaming Number	O	The Mobile Station Roaming Number employed to route this connection, if applicable.
Recording Entity	M	The E.164 number of the forwarding MSC
Incoming TKGP	O	The MSC trunk group on which the call originated at the forwarding MSC.
Outgoing TKGP	O	The trunk group on which the call left the forwarding MSC
Basic service	C	Bearer or teleservice employed, not always available e.g. in case of call forwarding unconditional.
Transparency Indicator	C	Only provided for those teleservices which may be employed in both transparent and non-transparent mode.
ChangeOfService	O	A list of changes of basic service during a connection each time-stamped.
Supp. Services	C	Supplementary services invoked as a result of this connection.
Event time stamps:	C	Seizure of incoming traffic channel (for unsuccessful call attempts)
	C	Answer (for successful calls)
	O	Release of traffic channel
Call duration	M	The chargeable duration of the connection for successful calls, the holding time of call attempts.
Cause for termination	M	The reason for the release of the connection.
Diagnostics	O	A more detailed reason for the release of the connection.
Data volume	C	The number of data segments transmitted if available at the MSC
Sequence no.	C	Partial record sequence number, only present in case of partial records.
Call reference	M	A local identifier distinguishing between transactions on the same MS
Additional Chg. Info	O	Charge/no charge indicator and additional charging parameters
Record extensions	O	A set of network/ manufacturer specific extensions to the record.
gsmSCF address	C	Identifies the CAMEL server serving the subscriber.
Service key	C	The CAMEL service logic to be applied.
Network call reference	C	An identifier to correlate transactions on the same call taking place in different network nodes, shall be present if CAMEL is applied.
MSC Address	C	This field contains the E.164 number assigned to the MSC that generated the network call reference.
CAMEL initiated CF indicator	C	Indicates that the CAMEL server initiated call forwarding.
Default call handling	O	Indicates whether or not a CAMEL call encountered default call handling. This field shall be present only if default call handling has been applied.
Number of DP encountered	O	Number that counts how often armed detection points (TDP and EDP) were encountered.
Level of CAMEL service	O	Indicator of the complexity of the CAMEL feature used.
Free format Data	C	This field contains data sent by the gsmSCF in the FCI messages. <u>The data can be sent either in one FCI message or several FCI messages with append indicator.</u>
CAMEL call leg information	C	Set of CAMEL information IEs. Each of these IEs contains information related to one outgoing CAMEL call leg.
Free format data append indicator	C	<u>Indicator if free format data from this CDR is to be appended to free format data in previous partial CDR.</u>
Default call handling 2	O	<u>Indicates whether or not a CAMEL call encountered default call handling for 2nd service such as dialled service. This field shall be present only if default call handling has been applied.</u>
GsmSCF address 2	C	<u>Identifies the CAMEL server serving the subscriber for 2nd service such as dialled service.</u>
Service key 2	C	<u>The CAMEL service logic to be applied for 2nd service such as dialled service.</u>
Free format Data 2	C	<u>This field contains data sent by the gsmSCF in the FCI message(s) for 2nd service such as dialled service. The data can be sent either in one FCI message or several FCI messages with append indicator.</u>
Free format data append indicator 2	C	<u>Indicator if free format data for 2nd service from this CDR is to be appended to free format data in previous partial CDR.</u>

B.2.4 Mobile terminated call attempt

If the generation of these records is enabled, then an MTC record shall be created for each incoming call attempt made for a mobile station. The MTC records shall be produced in the terminating MSC.

Table B.4: MTC record

Field		Description
Record Type	M	Mobile Terminated.
Served IMSI	M	IMSI of the called party.
Served IMEI	O	IMEI of the called ME.
Served MSISDN	O	The MSISDN of the called party.
Calling Number	C	The number of the calling party if available.
Connected Number	O	Only relevant in case of call forwarding where the "forwarded-to" number is recorded.
Recording Entity	M	The E.164 number of the visited (terminating) MSC
Incoming TKGP	O	The MSC trunk group on which the call originated.
Outgoing TKGP	O	The trunk group on which the call left the MSC, usually to the BSS
Location	C	The identity of the cell occupied by the called party when the call was set up including the location area code.
Change of Location	O	A list of changes in Location Area Code / Cell Id. each time-stamped.
Basic Service	M	Bearer or teleservice employed
Transparency Indicator	C	Only provided for those teleservices which may be employed in both transparent and non-transparent mode.
Change of Service	O	A list of changes of basic service during a connection each time-stamped.
Supp. services	C	Supplementary services invoked as a result of this connection.
AOC Parameters	O	The charge advice parameters sent to the MS on call set-up
Change of AOC Params.	O	New AOC parameters sent to the MS e.g. as a result of a tariff switch-over, including the time at which the new set was applied.
MS Classmark	M	The mobile station class mark
Change of Classmark	O	A list of changes to the classmark during the connection each time-stamped
Event time stamps:	C	Seizure of traffic channel for unsuccessful call attempts
	C	Answer time for successful calls
	O	Release of traffic channel
Call duration	M	The chargeable duration of the connection if successful, the holding time of the call if unsuccessful.
Radio Chan. Requested	O	The type of radio traffic channel (full / half etc.) requested by the MS.
Radio Chan. Used	M	The type of radio channel used (full or half rate).
Change of Rad. Chan	O	A list of changes each time stamped
Cause for term.	M	The reason for the release of the call.
Diagnostics	O	A more detailed reason for the release of the connection.
Data volume	C	The number of data segments transmitted, if available at the MSC
Sequence no.	C	Partial record sequence number, only present in case of partial records.
Call reference	M	A local identifier distinguishing between transactions at the same MS
Additional Chg. Info	O	Charge/no charge indicator and additional charging parameters
Record extensions	O	A set of network/ manufacturer specific extensions to the record.
Network call reference	C	An identifier to correlate transactions on the same call taking place in different network nodes, shall be present if CAMEL is applied.
MSC Address	C	This field contains the E.164 number assigned to the MSC that generated the network call reference.
Number of HSCSD Channels Requested	O	The maximum number of HSCSD channels requested as received from the MS at call set-up
Number of HSCSD Channels Allocated	O	The number of HSCSD channels allocated to the MS at call set-up
Change of HSCSD Parameters	O	A list of network or user initiated changes of number of HSCSD channels during a connection each timestamped. Shall only be present in case of an HSCSD call, if the basic HSCSD parameters are modified due the user or network initiated modification procedure.
Fixed Network User Rate	O	May be present for HSCSD connections.
Air Interface User Rate Requested	C	The total Air Interface User Rate Requested by the MS at call setup. Shall only be present for non-transparent HSCSD connections.

(continued)

Table B.4 (concluded): MTC record

Field		Description
Channel Coding Accepted	C	A list of the traffic channels codings accepted by the MS. Shall only be present for HSCSD connections.
Channel Coding Used	C	The traffic channels codings negotiated between the MS and the network at call setup. Shall only be present for HSCSD connections.
Speech Version Used	O	Speech version used for that call
Speech Version Supported	O	Speech version supported by the MS with highest priority indicated by MS
GsmSCF address	C	Identifies the CAMEL server serving the subscriber.
Service Key	C	The CAMEL service logic to be applied.
Default Call handling	O	Indicates whether or not a CAMEL call encountered default call handling. This field shall be present only if default call handling has been applied.
Free format Data	C	Indicator if free format data from this CDR is to be appended to free format data in previous partial CDR.
Free format data append indicator	C	Indicator if free format data from this CDR is to be appended to free format data in previous partial CDR.

B.2.13 Short message service, mobile originated

If enabled, an SMS-MO record shall be produced, within the originating MSC, for each short message sent by a mobile subscriber.

Table B.13: SMS-MO record

Field		Description
Record Type	M	SMS-Mobile originated.
Served IMSI	M	The IMSI of the subscriber sending the short message.
Served IMEI	O	The IMEI of the ME sending the message, if available.
Served MSISDN	O	The primary MSISDN of the subscriber sending the message.
MS Classmark	M	The mobile station classmark.
Service Centre	M	The address (E.164) of the SMS-service centre.
Recording Entity	M	The E.164 number of the visited MSC
Location	O	The Location Area Code and Cell Identity from which the message originated.
Event Time stamp	M	The time at which the message was received by the MSC from the subscriber.
Message Reference	M	A reference, provided by the MS uniquely identifying this message.
SMS Result	C	The result of the attempted delivery if unsuccessful.
Record extensions	O	A set of network/ manufacturer specific extensions to the record.
Destination number	O	The destination short message subscriber number.
CAMELSMSInformation	C	Set of CAMEL information IEs. Each of these IEs contains information related to CAMEL call leg related for the SMS.

B.2.19 Terminating CAMEL interrogation call attempt

If the generation of these records is enabled, a terminating CAMEL interrogation call attempt record shall be generated for each call toward a subscriber with a T-CSI and if the terminating trigger criterias are met. The record is generated in the GMSC/gsmSSF_carrying out the terminating CAMEL call handling.

Table B.19: Terminating CAMEL interrogation record

Field		Description
Record Type	M	Terminating CAMEL interrogation.
Served IMSI	M	IMSI of the called party
Served MSISDN	O	The MSISDN of the called party.
Recording Entity	M	The E.164 number of the GMSC.
Int. time stamp	M	Time at which the interrogation was invoked.
CAMEL Destination Number	M	The number available for routing after the CAMEL server enquiry.
GsmSCF Address	M	The CAMEL server serving the subscriber.
Service key	M	The CAMEL service logic to be applied.
Network call reference	M	An identifier to correlate transactions on the same call taking place in different network nodes, shall be present if CAMEL is applied.
MSC Address	M	This field contains the E.164 number assigned to the MSC that generated the network call reference.
Default call handling	O	Indicates whether or not a CAMEL call encountered default call handling. This field shall be present only if default call handling has been applied.
Record extensions	O	A set of network/ manufacturer specific extensions to the record.
Called Number	M	The address of the called party as received by the GMSC/gsmSSF.
Calling Number	C	The address of the calling party, if available.
Incoming TKGP	O	The GMSC trunk group on which the call originated.
Outgoing TKGP	O	The trunk group on which the call left the GMSC
Event time stamps:	C C O	Seizure of incoming traffic channel (for unsuccessful call attempts) Answer (for successful calls) Release of traffic channel
Call duration	M	The chargeable duration of the connection for successful calls, the holding time of call attempts.
Data volume	C	The number of data segments transmitted if available at the GMSC
Cause for termination	M	The reason for the release of the connection.
Diagnostics	O	A more detailed reason for the release of the connection.
Call reference	M	A local identifier distinguishing between transactions on the same MS
Sequence no.	C	Partial record sequence number, only present in case of partial records.
Number of DP encountered	O	Number that counts how often armed detection points (TDP and EDP) were encountered.
Level of CAMEL service	O	Indicator of the complexity of the CAMEL feature used.
Free format Data	C	This field contains data sent by the gsmSCF in the FCI message(s). <u>The data can be sent either in one FCI message or several FCI messages with append indicator.</u>
CAMEL call leg information	C	Set of CAMEL information IEs. Each of these IEs contains information related to one outgoing CAMEL call leg.
Free format data append indicator	C	<u>Indicator if free format data from this CDR is to be appended to free format data in previous partial CDR.</u>

B.3 Description of record fields

This subclause contains a brief description of each field of the call and event records described in the previous subclause.

B.3.13 Free format data

This field contains charging information sent by the gsmSCF in the FCI ~~message~~ messages as defined in 3G TS 29.078 GSM 09.78. The data can be sent either in one FCI message or several FCI messages with append indicator. This data is transferred transparently in the CAMEL sections of the relevant call records. 'Free format data' sent to the legID=1 is

always stored in the top level of the respective record. 'Free format data' sent to the legID >1 is stored in the appropriate CAMEL call leg information field.

If the FCI is received more than once during one continuing incoming/outgoing CAMEL call leg, the append indicator defines whether the FCI information is appended to previous FCI and stored in the relevant record or the information of the last FCI received is stored in the relevant record (the previous FCI information shall be overwritten).

In the event of partial output the currently valid 'Free format data' is stored in the partial record.

B.3.xx Free format data append indicator

This field contains an indicator whether free format data is to be appended to free format data stored in previous partial CDR. This field is needed in CDR postprocessing to sort out valid free format data for that call leg from sequence of partial records. Creation of partial records is independent on received FCIs and thus valid free format data may be divided to different partial records.

If field is missing then free format data in this CDR replaces all received free format data in previous CDRs. Append indicator is not needed in the first partial record. In following partial records indicator shall get value true if all FCIs received during that partial record have append indicator. If one or more of the received FCIs for that call leg during the partial record do not have append indicator then this field shall be missing.

B.3.xx Default call/SMS handling

This field indicates whether or not a CAMEL SMS-encountered default call-~~or~~/SMS-handling. This field shall be present only if default call ~~or~~/SMS-handling has been applied. Parameter is defined in HLR as part of CAMEL subscription information.

B.3.xx Camel SMS Information

This field contains following CAMEL information for mobile originated SMS:

- Default SMS handling

This field indicates whether or not a CAMEL encounters default SMS handling. This field shall be present only if default SMS handling has been applied.

- Free format data

See B.3.13.

- Calling Party Number

This field contains Calling Party Number modified by CAMEL service.

- CAMEL modified Service Centre

This field contains SMS-C address modified by CAMEL service.

- Destination Subscriber Number

This field contains short message Destination Number modified by CAMEL service.

B.3.xx Destination Number

This field contains short message Destination Number requested by the user.

B.3.xx GsmSCF address

This field identifies the CAMEL server serving the subscriber. Address is defined in HLR as part of CAMEL subscription information.

B.3.xx Service key

This field identifies the CAMEL service logic applied. Service key is defined in HLR as part of CAMEL subscription information.

B.3.xx Number of DP encountered

This field indicates how often CAMEL armed detection points (TDP and EDP) were encountered and is a measure of signalling between serving network and CAMEL service and complements 'Level of CAMEL service' field. Detection points from all applied CAMEL services for a single call leg and processed in the same gsmSSF shall be counted together.