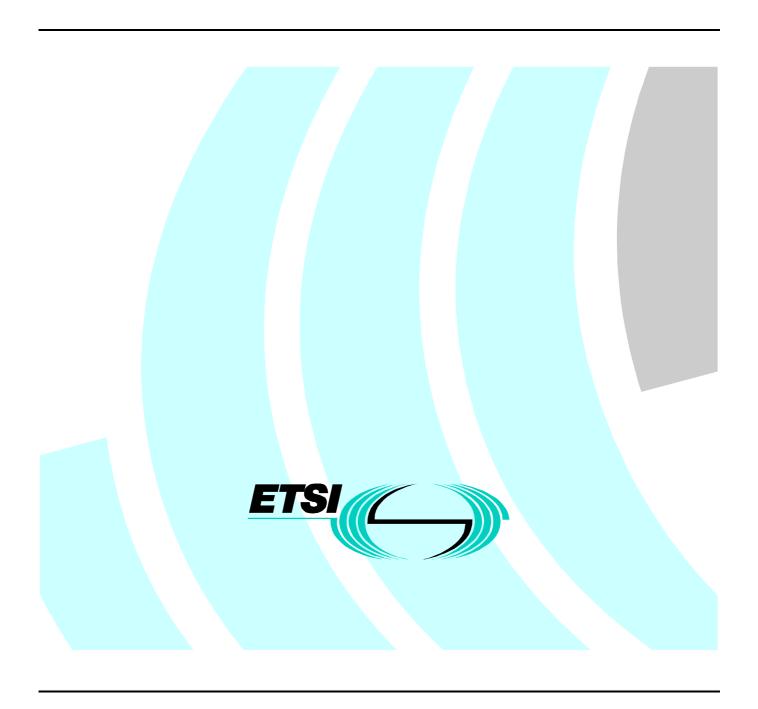# Final draft ETSI EN 301 668-1 V1.1.2 (2000-05)

European Standard (Telecommunications series)

Intelligent Network (IN);
Intelligent Network Capability Set 1 (CS1) extension;
Intelligent Network Application Protocol (INAP);
Part 1: Protocol specification for Camel Phase 2

Reference

DEN/SPS-03053-1

Keywords

IN, INAP, ISDN, mobile, protocol

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN), and is now submitted for the Voting phase of the ETSI standards Two-step Approval Procedure.

The present document is part 1 of a multi-part standard covering the IN Capability Set 1 (CS1) extension; Intelligent Network Application Protocol (INAP); Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase 2 as described below:

> **Part 1:   "Protocol specification for Camel Phase 2";**
>
> Part 2:   "Protocol Implementation Conformance Statement (PICS) proforma specification".
>
> NOTE: Further parts of the present document may be identified later.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1 Scope

The present document specifies the additions for Intelligent Network Application Protocol (INAP) to support the Camel Phase 2 Capability. The present document is based on ETS 300 374-1 [4].

ETS 300 374-1 [4] is also taken as an editorial basis for the present document. Only additions and modifications in respect to that ETS are specified in the present document. For Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase 2 only a restricted subset of the protocol aspects of ETS 300 374-1 [4] is necessary. This restriction is not defined in the present document. A profiling of CAMEL, i.e. which protocol aspects are used, is given by EN 301 668-2 [27]. Clauses and subclauses of ETS 300 374-1 [4] for which neither additions nor modifications are made do not appear in the present document. However, to ensure the same clause numbering of the present document as of ETS 300 374-1 [4], deleted clauses and subclauses are numbered implicitly.

As the present document specifies the additions in respect to the SSF it is assumed that the SCF is according to ETS 300 374-1 [4] taking into account the requirements defined in the present document for the SSF.

The protocol specification of the CAMEL Capability to the present document is considered as equivalent to GSM 09.78 [11].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

The following references are in addition to those of ETS 300 374-1 [4]:

[1]	ETSI EN 301 140-1: "Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 1: Protocol specification".

[2]	ETSI ETS 300 287: "Integrated Services Digital Network (ISDN); Signalling System No.7; Transaction Capabilities Application Part (TCAP) version 2".

[3]	ETSI ETS 300 356-1: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1993), modified]".

[4]	ETSI ETS 300 374-1: "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 1: Protocol specification".

[5]	ETSI ETS 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[6]	ETSI ETS 300 974: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification (GSM 09.02)".

[7]	GSM 02.24: "Digital cellular telecommunications system (Phase 2); Description of Charge Advice Information (CAI)".

[8]	GSM 02.78: "Digital cellular telecommunications system (Phase 2+); Customized Applications for Mobile network Enhanced Logic (CAMEL) - Phase 2. Service description. Stage 1".

[9] GSM 03.40: "Digital cellular telecommunications system (Phase 2+); Technical realization of the Short Message Service (SMS); Point-to-Point (PP)".

[10]   GSM 03.78 (Release 1998) V7.3.0 (2000-04): "Digital cellular telecommunications system (Phase 2+); Customized Applications for Mobile network Enhanced Logic (CAMEL) - Phase 2; Stage 2".

[11]   GSM 09.78 (Release 1998) V7.0.0 (1999-08): "Digital cellular telecommunications system (Phase 2+); Customized Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification".

[12]   ANSI T1.113 (1995): "Signalling System No. 7(SS7); Integrated Services Digital Network (ISDN) User Part".

[13]   ITU-T Recommendation Q.711: "Functional Description of the Signalling Connection Control Part".

[14]   ITU-T Recommendation Q.712: "Definition and function of signalling connection control part messages".

[15]   ITU-T Recommendation Q.713 : "Signalling Connection Control Part formats and codes".

[16]   ITU-T Recommendation Q.714: "Signalling Connection control part procedures".

[17]   ITU-T Recommendation Q.716: "Signalling System No. 7 – Signalling Connection Control Part (SCCP) Performance".

[18]   ITU-T Recommendation Q.773: "Transaction capabilities formats and encoding".

[19]   ITU-T Recommendation X.209: "Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)".

[20]   ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1 (1995): "Information technology; Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[21]   ITU-T Recommendation X.681 (1994) | ISO/IEC 8824-2 (1995): "Information technology; Abstract Syntax Notation One (ASN.1): Information object specification".

[22]   ITU-T Recommendation X.682 (1994) | ISO/IEC 8824-3 (1995): "Information technology; Abstract Syntax Notation One (ASN.1): Constraint specification".

[23]   ITU-T Recommendation X.683 (1994) | ISO/IEC 8824-4 (1995): "Information technology; Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications".

[24]   ITU-T Recommendation X.690 (1994) | ISO/IEC 8825-1 (1995): "Information technology; ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".

[25]   ITU-T Recommendation X.880 (1994) | ISO/IEC 13712-1 (1995): "Information technology; Remote Operations: Concepts, model and notation".

[26]   ITU-T Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".

[27]   ETSI EN 301 668-2 (V1.1): "Intelligent Network (IN); IN Capability Set 1 (CS1) extension; Intelligent Network Application Protocol (INAP); Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase 2; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[28]   ANSI T1.112-1996: "American National Standards for Telecommunications– Signalling System Number 7 (SS7) – Signalling Connection Control Part (SCCP)".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply in addition to those of ETS 300 374-1 [4]:

ACM	Address Complete Message
CAMEL	Customized Applications for Mobile network Enhanced Logic
CAP	CAMEL Application Part
CIC	Carrier Identification Code
CSE	CAMEL Service Environment
CSI	CAMEL Subscription Information
IAM	Initial Address Message
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
NA	North American
OCSI	Originating CSI
REL	Release

Within the present document the terms gsmSSF and SSF and the terms gsmSCF and SCF respectively are used synonymously.

4 General

4.1 Definition methodology

For the purpose of the present document, ITU-T Recommendation X.880 [25] and the ITU-T Recommendations for ASN.1 X.680 [20], X.681 [21], X.682 [22], X.683 [23] and X.690 [24] for the basic encoding rules apply.

4.2 Example physical scenarios

The following physical scenarios as defined in ETS 300 374-1 [4] subclause 7.3.5.1.1 "SRF connect physical procedures" are supported:

- case a) SSF relay; Non-integrated SRF and Integrated SRF;

- case b) direct path SCP to IP;

- case c) Assist with relay; return control to Initiating SSP on completion of UI; Non-integrated SRF and Integrated SRF;

- case d) Assist without relay; return control to Initiating SSP on completion of UI.

4.3 INAP addressing

CAMEL Applications Part (CAP) makes use of the services offered by the Signalling Connection Control Part (SCCP).

The following SCCP versions are supported by CAP Version 2:

- signalling Connection Control Part , Signalling System no. 7 CCITT ('Blue Book SCCP');

- signalling Connection Control Part , Signalling System no. 7 ITU-T Recommendation Q.711 to Q.716 ('White Book SCCP');

- ANSI T1.112-1996: "American National Standards for Telecommunications – Signalling System Number 7 (SS7) – Signalling Connection Control Part (SCCP)".

SCCP version used for CAP version 2 is a network option.

When CAP uses White Book SCCP to send a message, then:

- if the CAP message can be sent in one UDT message either UDT message or XUDT message shall be used;

- if the CAP message cannot be sent in one UDT message SCCP segments the message into two or more XUDT messages.

The transmission of XUDT messages may fail. Failure will occur when the destination SCCP, or any intermediate SCCP, does not support White Book SCCP.

Support of ANSI T1.112 SCCP applies only to PLMNs in North America. Interworking between a PLMN in North America and a PLMN outside North America will involve an STP to translate between ANSI SCCP and ITU-T/CCITT SCCP.

4.3.1   Quality of service parameters

The class (class 0 or class 1) of SCCP is set as required by the application. However, class 1 shall be requested by any application that can send more than 1 TCAP message to its peer (iconsecutive TR-CONTINUE) before receiving a response from its peer (TR-CONTINUE or TR-END).

On receipt of a TC-RESULT-NL indication, the TC-USER shall request the transfer of a reject component using TC-U-REJECT request primitive, with the appropriate problem code (mistyped parameter).

The return option may be used if requested by the application (Network Operator to determine).

4.3.2   SCCP addressing

Using the CAMEL Application Part (CAP) for this function implies the use of Transaction Capabilities (TC) of CCITT Signalling System No. 7 and the Signalling Connection Control Part (SCCP) of either CCITT Signalling System No. 7 (for non-North American PLMNs) or ANSI Signalling System No. 7 (for North American PLMNs).

4.4   Definition and usage of LegID

NOTE: This subclause is not part of ETS 300 374-1 [4].

For all operations containing a LegID:

- LegID = 1 shall always refer to the Calling Party, more specifically that party in the call present when InitialDP is sent to the SCF;

- LegID = 2 shall always refer to the Called Party, more specifically that party in the call created as a result of the Connect or Continue operations.

4.5   Detection Points

NOTE: This subclause is not part of ETS 300 374-1 [4] nor GSM 09.78 [11], but in line with GSM 03.78 [10].

4.5.1   DP processing rules

The following table indicates the resulting type of relationship after the completion of the action indicated. The titles of the columns indicate the postcondition of the action.

Table 1

postcondition action	- one or more EDP-Rs armed, or - SSF is in any State except Monitor or Idle	- one or more EDP-Ns armed, or - one or more Call Information Reports outstanding, or - an Apply Charging Report outstanding	- no EDP-Ns armed, and - no Call Information Reports outstanding, and - no Apply Charging Report outstanding
normal behaviour; e.g. ERBCSM, CIR or ACR is sent	control relationship	monitor relationship	idle
Abandon	control relationship	monitor relationship	idle
Disconnect	control relationship	monitor relationship	idle
Call Release from SCF	n/a	n/a	idle
NOTE 1: ERBCSM: EventReporBCSM; CIR: CallInformationReport; ACR: ApplyChargingReport. NOTE 2: n/a: not applicable (i.e. after releasing the call no EDPs remain armed. NOTE 3: EDPs are disarmed by the SSF as they are encountered and reported to the SCF, or when the leg clears.			

5 Reflection of TCAP Application Context (AC)

The following note is included:

> NOTE: If the SSF provides an AC which is not acceptable to the SCF, then an alternate AC should not be returned. If the AC presented to the SCF is not acceptable then this is most probably due to an error in subscriber data provisioning or an error at the SSF.

6 Additional abstract syntax

This clause specifies the **additional** or **modified** abstract syntax, using ASN.1 as defined in ITU-T Recommendation X.208 [26] and ITU-T Recommendations X.680 [20], X.681 [21], X.682 [22] and X.683 [23]. Furthermore, it has to be taken into account that some constants used for the definition of types are defined with other values in this standard as in respect to ETS 300 374-1 [4].

The encoding rules which are applicable to the defined abstract syntax are the Basic Encoding Rules for ASN.1, defined in ITU-T Recommendation X.209 [19] and ITU-T Recommendation X.690 [24] with the restrictions as described in ITU-T Recommendation Q.773 [18], subclause 4.1.1, modified by ETS 300 287 [2]. Additional encodings are cited for parameters used in existing ISUP (ETS 300 356-1 [3]) and DSS1 (ETS 300 403-1 [5]) standards. Existing data types from the CS1 ETSI Core INAP (ETS 300 374-1 [4]) and MAP (ETS 300 974 [6]) standards have been used. Where parameter mappings in CS1 ETSI Core INAP (ETS 300 374-1 [4]) are not defined for functions imported from CS1 ETSI Core INAP, but parameter mappings are defined in CS2 ETSI Core INAP (EN 301 140-1 [1]) then the parameter mappings in CS2 ETSI Core INAP (EN 301 140-1 [1]) shall be used.

> NOTE: If this specification uses only a subtype, this will be indicated in EN 301 668-2 [27].

As for CS-2 in the following subclauses the ASN.1 extension marker "..." is not commented out.

6.1 Operation types

```
-- The following definitions and enhancements of operations apply.

ApplyCharging
--   This operation is used for interacting from the SCF with the SSF CSE-controlled call duration
--   charging mechanism.
--   The following ERROR is in addition
        UnknownLegID

ApplyChargingReport
--   The ApplyChargingReport operation provides the feedback from the SSF to the SCF for the
--   CSE-controlled call duration charging mechanism.
```

```
CallInformationRequest
--  The following ERROR is in addition
        UnknownLegID

FurnishChargingInformation
--  This operation supports other charging scenarios besides those indicated in ETS 300 374-1 [4].
--  NOTE: The usage is as defined in CS2 ETSI Core INAP (EN 301 140-1 [1]).

RequestReportBCSMEvent
--  The following ERROR is in addition
        UnknownLegID

SendChargingInformation
--  This operation is used to instruct the SSF on the charging information which the SSF shall
--  send to the user by means of access signalling. No specific charging scenario is being
--  supported.
```

6.2   Operation timers

The following value range apply for operation specific timers:

short: 1 to 20 seconds.

6.3   Data types

```
--  The EXTENSION MACRO is replaced by the EXTENSION CLASS defined in subclause 6.6 Classes.
--  However, the Criticality type remains.

CriticalityType ::= ENUMERATED {
        ignore(0),
        abort(1)
        }

--  This section contains additional type definitions.


--  The following datatypes are imported.

IMPORTS

    BothwayThroughConnectionInd
FROM CS2-DataTypes { ccitt(0) identified-organization(4) etsi(0) inDomain(1)
in-network(1) CS2(20) modules(0) in-cs2-datatypes(0) version1(0)}

    IMSI,
    ISDN-AddressString,
    Ext-BasicServiceCode,
    NAEA-CIC

FROM MAP-CommonDataTypes { ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version4(4)}

    LocationInformation,
    SubscriberState

FROM MAP-MS-DataTypes { ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-MS-DataTypes(11) version4(4)}

    CallReferenceNumber,
    SuppressionOfAnnouncement

FROM MAP-CH-DataTypes { ccitt(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CH-DataTypes(13) version4(4)};

-- Argument Data Types

ApplyChargingArg                    ::= SEQUENCE {
--  The sendCalculationToSCPIndication component is deleted.
--  The partyToCharge component is defined as follows:
    partyToCharge           [2] SendingSideID               DEFAULT sendingSideID : leg1,

CallInformationReportArg            ::= SEQUENCE {
--  The following component is included before the extension marker.
    legID                   [3] ReceivingSideID         OPTIONAL,

CallInformationRequestArg        ::= SEQUENCE {
--  The following component is included before the extension marker.
    legID                   [3] SendingSideID               OPTIONAL,
```

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```
ConnectArg                    ::= SEQUENCE {
-- The following component is in addition after the redirectionInformation component.
    genericNumbers            [14] GenericNumbers          OPTIONAL,

-- The following components are included before the extension marker.
    suppressionOfAnnouncement [55] SuppressionOfAnnouncement OPTIONAL,
    oCSIApplicable            [56] OCSIApplicable           OPTIONAL,
    ...

-- The following component is in addition after the extension marker.
    na-Info                        [57] NA-Info                          OPTIONAL
-- na-Info is included at the discretion of the gsmSCF operator.

ConnectToResourceArg                 ::= SEQUENCE {
-- The following component is included before the extension marker.
    serviceInteractionIndicatorsTwo [7] ServiceInteractionIndicatorsTwo   OPTIONAL.

EstablishTemporaryConnectionArg      ::= SEQUENCE {
-- The following component is included before the extension marker.
    serviceInteractionIndicatorsTwo [7] ServiceInteractionIndicatorsTwo   OPTIONAL

-- The following component is in addition after the extension marker.
    na-info                        [50] NA-Info                          OPTIONAL
-- na-Info is included at the discretion of the gsmSCF operator.

EventReportBCSMArg            ::= SEQUENCE {
-- The legID component is defined as follows:
    legID               [3] ReceivingSideID    OPTIONAL,

InitialDPArg                ::= SEQUENCE {

-- The following components are included in addition before the extension marker.
    iMSI                     [50] IMSI                 OPTIONAL,
    subscriberState          [51] SubscriberState      OPTIONAL,
    locationInformation      [52] LocationInformation  OPTIONAL,
    ext-basicServiceCode     [53] Ext-BasicServiceCode OPTIONAL,
    callReferenceNumber      [54] CallReferenceNumber  OPTIONAL,
    mscAddress               [55] ISDN-AddressString   OPTIONAL,
    calledPartyBCDNumber     [56] CalledPartyBCDNumber OPTIONAL,
    timeAndTimezone          [57] TimeAndTimezone         OPTIONAL,
    gsm-ForwardingPending    [58] NULL                 OPTIONAL,
    ...

-- The following component is in addition after the extension marker.
    initialDPArgExtension          [59] InitialDPArgExtension           OPTIONAL

-- If iPSSPCapabilities is not present then this denotes that a colocated SRF is not supported by
-- the SSF. If present, then the SSF supports a colocated SRF capable of playing announcements via
-- elementaryMessageIDs and variableMessages, the playing of tones and the collection of DTMF
-- digits.

SendChargingInformationArg    ::= SEQUENCE {
-- The partyToCharge component is defined as follows:
    partyToCharge          [1] SendingSideID,
```

-- Common Data Types

```
-- The AChBillingChargingCharacteristics is sub-defined as follows:
AChBillingChargingCharacteristics        ::=
    OCTET STRING (SIZE(minAChBillingChargingLength .. maxAChBillingChargingLength))
    (CONSTRAINED BY {-- shall be the result of the BER-encoded value of the type CAMEL-
AChBillingChargingCharacteristics --})

-- The value of the AchBillingChargingCharacteristics of type OCTET STRING carries a value of the
-- ASN.1 data type : CAMEL-AchBillingChargingCharacteristics. The normal encoding rules are used to
-- encode this value.
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

CAMEL-AChBillingChargingCharacteristics        ::= CHOICE {
    timeDurationCharging      [0] SEQUENCE {
        maxCallPeriodDuration      [0] INTEGER (1..864000),
        releaseIfdurationExceeded  [1] ReleaseIfDurationExceeded  OPTIONAL,
        tariffSwitchInterval       [2] INTEGER (1..86400)      OPTIONAL
    }
}

-- maxCallPeriodDuration is measured in100 millisecond units.
-- tariffSwitchInterval is measured in 1 second units.

AlertingPattern                    ::= OCTET STRING (SIZE (3))

-- The encoding of this parameter is as defined in ETS 300 974 [6].
-- Only the last octet is used. The remaining octets should be sent with all bits set to zero.
```

```
--  The receiving side shall ignore the first two octets.

AOCBeforeAnswer      ::= SEQUENCE {
    aOCInitial              [0] CAI-GSM0224,
    aOCSubsequent           [1] AOCSubsequent          OPTIONAL
    }

AOCSubsequent                   ::= SEQUENCE {
    cAI-GSM0224             [0] CAI-GSM0224 ,
    tariffSwitchInterval    [1] INTEGER (1..86400)      OPTIONAL
    }

--   tariffSwitchInterval is measured in 1 second units

CAI-GSM0224                     ::= SEQUENCE {
    e1                      [0] INTEGER (0..8191)       OPTIONAL,
    e2                      [1] INTEGER (0..8191)       OPTIONAL,
    e3                      [2] INTEGER (0..8191)       OPTIONAL,
    e4                      [3] INTEGER (0..8191)       OPTIONAL,
    e5                      [4] INTEGER (0..8191)       OPTIONAL,
    e6                      [5] INTEGER (0..8191)       OPTIONAL,
    e7                      [6] INTEGER (0..8191)       OPTIONAL
    }

--  Indicates Charge Advice Information to the Mobile Station. For information regarding
--  parameter usage, refer to GSM 02.40 [31].

CalledPartyBCDNumber         ::= OCTETT STRING (SIZE (minCalledPartyBCDNumberLength ..
maxCalledPartyBCDNumberLength))

--  Indicates the Called Party Number, including service selection information. Refer to GSM 04.08
--  [30] for encoding. This data type carries only the "type of number", "numbering plan
--  identification" and "number digit" fields defined in [30]; it does not carry the "called party
--  BCD number IEI" or "length of called party BCD number contents".

--  The CallResult is sub-defined as follows:
CallResult                       ::= OCTET STRING (SIZE (minCallResultLength ..
                                                  maxCallResultLength))
                                 (CONSTRAINED BY {-- shall be the result of the BER-encoded
value of type CAMEL-CallResult --})
-- The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

CAMEL-CallResult                     ::= CHOICE {
    timeDurationChargingResult [0] SEQUENCE {
        partyToCharge          [0] ReceivingSideID,
        timeInformation        [1] TimeInformation
        callActive             [2] BOOLEAN            DEFAULT TRUE
        }
    }

--  tariffSwitchInterval is measured in 1 second units.

--  The CollectedDigits subcomponents are restricted as follows:
    minimumNbOfDigits                  [0] INTEGER (1..16)               DEFAULT 1,
    maximumNbOfDigits                  [1] INTEGER (1..16),

DateAndTime                  ::= OCTET STRING (SIZE(7))

--  DateAndTime is BCD encoded. The year digit indicating millennium occupies bits 0-3 of the first
octet, and the year  digit indicating century occupies bits 4-7 of the first octet. The following
octets are encoded as the DateAndTime octets of ETS 300 374-1 [4].

EventSpecificInformationBCSM       ::=  CHOICE {
--  The component "tCalledPartyBusySpecificInfo" is renamed to "tBusySpecificInfo".

--  The component "tBusySpecificInfo" is enhanced as follows:
    tBusySpecificInfo         [8] SEQUENCE {
        busyCause                     [0] Cause       OPTIONAL,
        callForwarded                 [50] NULL       OPTIONAL,
        ...
        },

--  The component "tBusySpecificInfo" is enhanced as follows:
    tNoAnswerSpecificInfo       [9] SEQUENCE {
        callForwarded                 [50] NULL       OPTIONAL,
        ...
        },

EventTypeBCSM                            ::= ENUMERATED {
--  The EnumerationItem "tCalledPartyBusy(13)" is renamed to "tBusy(13)".
```

```
--  The Extensionfield type is defined as follows:

ExtensionField ::= SEQUENCE {
    type        EXTENSION.&id ({SupportedExtensions}),
            -- shall identify the value of an EXTENSION type
    criticality     CriticalityType DEFAULT ignore,
    value       [1]EXTENSION.&ExtensionType
                    ({SupportedExtensions}{@type})
    }

--  The FCIBillingChargingCharacteristics is sub-defined as follows:
FCIBillingChargingCharacteristics   ::= OCTET STRING (SIZE (minFCIBillingChargingLength ..
                                    maxFCIBillingChargingLength))
                            (CONSTRAINED BY {-- shall be the result of the BER-encoded
value of type CAMEL-FCIBillingChargingCharacteristics --})
--  This parameter indicates the billing and/or charging characteristics.
--  The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

CAMEL-FCIBillingChargingCharacteristics ::= CHOICE{
    fCIBCCCAMELsequence1    [0] SEQUENCE {
        freeFormatData          [0] OCTET STRING (SIZE (minFCIBillingChargingDataLength..
                            maxFCIBillingChargingDataLength)),
        partyToCharge           [1] SendingSideID        DEFAULT sendingSideID : leg1
        }
    }

GenericNumber               ::= OCTET STRING (SIZE(minGenericNumberLength..
                            maxGenericNumberLength))

--  Indicates a generic number. Refer to ETS 300 356-1 [3] Generic number for encoding.

GenericNumbers              ::= SET SIZE(1..numOfGenericNumbers) OF GenericNumber

--  The InitialDPArgExtension type is defined as follows:
InitialDPArgExtension           ::= SEQUENCE {
    naCarrierInformation            [0] NACarrierInformation        OPTIONAL,
    gmscAddress                     [1] ISDN-AddressString          OPTIONAL,
    ...
}
--  naCarrierInformation is included at the discretion of the gsmSSF operator.

IPSSPCapabilities               ::= OCTET STRING (SIZE (minIPSSPCapabilitiesLength..
                maxIPSSPCapabilitiesLength))

--  The IPSSPCapabilities is the same as for ETS 300 374-1 [4]. However, the content is not defined
--  by the network operator but shall be encoded as indicated in the following:
--  The parameter has two parts, a standard and a bilateral part. The standard part indicates
--  capabilities defined as optional in this version that shall be recognised (but not necessarily
--  supported) by a SCF of this version. The bilateral part contains further information that is not
--  specified in this standard, but which is set according to bilateral agreements between network
--  operators and/or equipment vendors. The last octet of the standard part is indicated by bit 7
--  being set to 0, otherwise Bit 7 of a standard part octet is set to 1 indicating that the standard
--  part continues in the following octet.

--  Coding is as follows:

--  Octet 1             Standard Part for this version
--  Bit Value           Meaning
--  0   0               IPRoutingAddress not supported
--      1               IPRoutingAddress supported
--  1   0               VoiceBack not supported
--      1               VoiceBack supported
--  2   0               VoiceInformation not supported, via speech recognition
--      1               VoiceInformation supported, via speech recognition
--  3   0               VoiceInformation not supported, via voice recognition
--      1               VoiceInformation supported, via voice recognition
--  4   0               Generation of voice announcements from Text not supported
--      1               Generation of voice announcements from Text supported
--  5   -               Reserved
--  6   -               Reserved
--  7   0               End of standard part
--      1               This value is reserved in CAP V.2
--  Octets 2 to 4           Bilateral Part: Network operator / equipment vendor specific

MessageID                   ::= CHOICE {
--  Use of the text parameter is  network operator/equipment vendor specific.

--  The NA parameter types are defined as follows:

NACarrierInformation            ::= SEQUENCE {
        naCarrierId             [0] NAEA-CIC                         OPTIONAL,
        naCICSelectionType      [1] NACarrierSelectionInfo           OPTIONAL,
        ...}
```

ETSI

```
NACarrierSelectionInfo              ::= OCTET STRING (SIZE (1))
--  NA carrier selection information octet carries the same values as ANSI
--  ISUP T1.113 [12]:        '00'H – not indicated or not explicitly provided
--                           '01'H – subscribed not dialled
--                           '02'H – subscribed and dialled
--                           '03'H – subscribed with dialling undetermined
--                           '04'H – dialled CIC not subscribed

NAChargeNumber                      ::= OCTET STRING (SIZE (2..7))
--  This parameter uniquely identifies the chargeable number for a call sent into a North American
--  long distance carrier. It transports the ChargeNumber Parameter Field
--  as defined in ANSI ISUP T1.113 [12]. This provides
--  - 1 octet for the nature of address indicator field, plus
--  - 1 octet for a numbering plan field, plus
--  - up to 5 octets for the address signal (up to 10 digits)

--  The Charge Number in ANSI T1.113 [12] normally contains a 10 digit national number within the
 North
--  American Numbering Plan (NANP); longer (e.g. international) charge numbers are not supported in
--  T1.113

NA-Info                             ::= SEQUENCE {
    naCarrierInformation              [0] NACarrierInformation           OPTIONAL,
    naOliInfo                         [1] NAOliInfo                      OPTIONAL,
    naChargeNumber                    [2] NAChargeNumber                 OPTIONAL,
    ...
    }

NAOliInfo                           ::= OCTET STRING (SIZE (1))
--  NA Oli information takes the same values as the Originating Line Information parameter
--  defined in ANSI ISUP T1.113 [12]
--  e.g.    '3D'H – Decimal value 61 - Cellular Service (Type 1)
--          '3E'H – Decimal value 62 - Cellular Service (Type 2)
--          '3F'H – Decimal value 63 - Cellular Service (roaming)

OCSIApplicable          ::= NULL
--  Indicates that the OCSI, if present, shall be applied
--  on the outgoing call leg created with a Connect operation.

ReceivingSideID             ::= CHOICE {receivingSideID [1] LegType}
--  used to identify LegID in operations sent from SSF to SCF.
--  This type is equal to the ETS 300 374-1 [4] selection type "receivingSideID<LegID".

ReleaseIfDurationExceeded           ::= SEQUENCE {
        tone                    BOOLEAN DEFAULT FALSE,
        ...,
        extensions              [10] SEQUENCE SIZE(1..numOfExtensions)  OF
                                ExtensionField        OPTIONAL
        }

--  Indicates that the call shall be released, with optional warning tone.

--  The SCIBillingChargingCharacteristics is sub-defined as follows:
SCIBillingChargingCharacteristics   ::= OCTET STRING (SIZE (minSCIBillingChargingLength ..
                                                maxSCIBillingChargingLength))
                                (CONSTRAINED BY {-- shall be the result of the BER-encoded
value of type CAMEL-SCIBillingChargingCharacteristics --})
--  Indicates AOC information to be sent to a user.
--  The violation of the UserDefinedConstraint shall be handled as an ASN.1 syntax error.

CAMEL-SCIBillingChargingCharacteristics     ::= CHOICE {
    aOCBeforeAnswer     [0] AOCBeforeAnswer,
    aOCAfterAnswer      [1] AOCSubsequent
    }

SendingSideID                       ::= CHOICE {sendingSideID [0] LegType}
--  used to identify LegID in operations sent from SCF to SSF.
--  This type is identical to the ETS 300 374-1 [4] selection type "sendingSideID<LegID".

ServiceInteractionIndicatorsTwo     ::= SEQUENCE {
    bothwayThroughConnectionInd [2] BothwayThroughConnectionInd     OPTIONAL
    }

TimeInformation             ::= CHOICE {
    timeIfNoTariffSwitch        [0] TimeIfNoTariffSwitch,
    timeIfTariffSwitch          [1] TimeIfTariffSwitch
    }

--  Indicates call duration information

TimeIfNoTariffSwitch                ::= INTEGER(0..864000)
```

ETSI

```
TimeIfTariffSwitch                  ::= SEQUENCE {
    timeSinceTariffSwitch     [0] INTEGER(0..864000),
    tariffSwitchInterval      [1] INTEGER(1..864000)           OPTIONAL
    }

TimeAndTimezone              ::=
    OCTET STRING(SIZE(minTimeAndTimezoneLength..maxTimeAndTimezoneLength))

-- Indicates the time and timezone, relative to GMT. This parameter BCD encoded.
-- The year digit indicating millennium occupies bits 0-3 of the first octet, and the year digit
-- indicating century occupies bits 4-7 of the first octet.
-- The year digit indicating decade occupies bits 0-3 of the second octet, whilst the digit
-- indicating the year within the decade occupies bits 4-7 of the second octet.
-- The most significant month digit occupies bits 0-3 of the third octet,  and the least
-- significant month digit occupies bits 4-7 of the third octet.
-- The most significant day digit occupies bits 0-3 of the fourth octet, and the least significant
-- day digit occupies bits 4-7 of the fourth octet.
-- The most significant hours digit occupies bits 0-3 of the fifth octet,  and the least
-- significant hours digit occupies bits 4-7 of the fifth octet.
-- The most significant minutes digit occupies bits 0-3 of the sixth octet, and the least
-- significant minutes digit occupies bits 4-7 of  the sixth octet.
-- The most significant seconds digit occupies bits 0-3 of the seventh octet, and the least
-- significant seconds digit occupies bits 4-7 of the seventh octet.
-- The timezone information occupies the eight octet.
-- For the encoding of Timezone refer to Reference, GSM 03.40 [9]
-- digits are encoded as follows:
--
-- Bit   7 6 5  4  |  3  2  1  0
--       2nd digit | 1st digit          Octet 1
--       3rd digit | 4th digit          Octet 2
--            ..                            ..
--       nth digit | n-1th digit        Octet m
--
--       0000     digit 0
--       0001     digit 1
--       0010     digit 2
--       0011     digit 3
--       0100     digit 4
--       0101     digit 5
--       0110     digit 6
--       0111     digit 7
--       1000     digit 8
--       1001     digit 9
--       1010     spare
--       1011     spare
--       1100     spare
--       1101     spare
--       1110     spare
--       1101     spare
--
-- where the leftmost bit of the digit is either bit 7 or bit 3 of the octet.

VariablePart                        ::= CHOICE {
-- The date component is defined as follows:
    date                       [3] OCTET STRING (SIZE(4)), -- YYYYMMDD, BCD coded

-- Date is BCD encoded.
-- The year digit indicating millennium occupies bits 0-3 of the first octet, and the year digit
-- indicating century occupies bits 4-7 of the first octet. The year digit indicating decade
-- occupies bits 0-3 of the second octet, whilst the digit indicating the year within the decade
-- occupies bits 4-7 of the second octet.
-- The most significant month digit occupies bits 0-3 of the third octet, and the least significant
-- month digit occupies bits 4-7 of the third octet.
-- The most significant day digit occupies bits 0-3 of the fourth octet, and the least significant
-- day digit occupies bits 4-7 of the fourth octet.

-- Definition of range constants

-- The range constants which are network specific in ETS 300 374-1 [4] are profiled in
-- EN 301 668-2 [27].

numOfInfoItems                  INTEGER ::= 4

-- Additional constants are defined as follows:

minCalledPartyBCDNumberLength       INTEGER ::= 1
maxCalledPartyBCDNumberLength       INTEGER ::= 41
minFCIBillingChargingDataLength     INTEGER ::= 1
maxFCIBillingChargingDataLength     INTEGER ::= 40
minTimeAndTimezoneLength            INTEGER ::= 8
maxTimeAndTimezoneLength            INTEGER ::= 8
minGenericNumberLength              INTEGER ::= 3
maxGenericNumberLength              INTEGER ::= 11
```

```
numOfGenericNumbers                  INTEGER ::= 5

--   APPLICATION SERVICE ELEMENTS

GSM-SCF-Activation-ASE                ::= APPLICATION-SERVICE-ELEMENT
    -- consumer is SSF
    CONSUMER INVOKES {
        initialDP
        }

GSM-SCF-GSM-SRF-activation-of-assist-ASE    ::= APPLICATION-SERVICE-ELEMENT
    -- consumer is SSF/SRF
    CONSUMER INVOKES {
        assistRequestInstructions
        }

GSM-SSF-call-processing-ASE           ::= APPLICATION-SERVICE-ELEMENT
    -- supplier is SCF
    SUPPLIER INVOKES {
        continue
        }
```

6.4   Application Service Elements

The Application Service Elements are put in a separate subclause and ASN.1 module.

6.4bis   Application contexts

```
CAP-v2-gsmSSF-to-gsmSCF-AC APPLICATION-CONTEXT
-- dialogue initiated by SSF with InitialDP
INITIATOR CONSUMER OF {
    GSM-SCF-activation-ASE,
    Assist-connection-establishment-ASE,
    Non-assisted-connection-establishment-ASE,
    Generic-disconnect-resource-ASE,
    Connect-ASE,
    Call-handling-ASE,
    BCSM-event-handling-ASE,
    Charging-ASE,
    GSM-SSF-call-processing-ASE,
    Timer-ASE,
    Billing-ASE,
    Call-report-ASE,
    Signalling-control-ASE,
    Specialized-resource-control-ASE,
    Cancel-ASE,
    Activity-test-ASE
    }
::= {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) ac(0)
cap-gsmssf-to-gsmscf(50) version1(0)};


CAP-v2-assist-gsmSSF-to-gsmSCF-AC   APPLICATION-CONTEXT
-- dialogue initiated by SSF with AssistRequestInstructions
INITIATOR CONSUMER OF {
    GSM-SCF-GSM-SRF-activation-of-assist-ASE,
    Generic-disconnect-resource-ASE,
    Non-assisted-connection-establishment-ASE,
    Timer-ASE,
    Specialized-resource-control-ASE,
    Cancel-ASE,
    Activity-test-ASE
    }
::= {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) ac(0)
cap-assist-handoff-gsmssf-to-gsmscf(51) version2(1)};


CAP-v2-gsmSRF-to-gsmSCF-AC  APPLICATION-CONTEXT
-- dialogue initiated by SRF with AssistRequestInstructions
INITIATOR CONSUMER OF {
    GSM-SCF-GSM-SRF-activation-of-assist-ASE,
    Specialized-resource-control-ASE,
    Cancel-ASE
    Activity-test-ASE
    }
::= {ccitt(0) identified-organization(4) etsi(0) mobileDomain(0) gsm-Network(1) ac(0)cap-gsmSRF-to-
gsmscf(52) version2(1)};
```

6.5 Classes

This subclause defines the following classes.

```
-- The following items are imported.

IMPORTS

    Code
        FROM Remote-Operations-Information-Objects
                {joint-iso-ccitt remote-operations(4) informationObjects(5) version1(0)};


EXTENSION ::= CLASS {
    &ExtensionType,
    &criticality    CriticalityType DEFAULT ignore,
    &id Code
    }
WITH SYNTAX {
    EXTENSION-SYNTAX    &ExtensionType,
    CRITICALITY &criticality,
    IDENTIFIED BY   &id
    }
-- Example of addition of an extension named 'Some Network Specific Indicator' of type
-- BOOLEAN, with criticality 'ignore' and to be identified with object ID 'ccitt(0)
-- identified-organization(4) organisation(x) gsm(x) capextension':
-- Example of definition using the above information object class:
--
-- SomeNetworkSpecificIndicator  EXTENSION ::= {
-- EXTENSION-SYNTAX    BOOLEAN
-- CRITICALITY         ignore
-- IDENTIFIED BY       global : xxxxxx
-- }

firstExtension EXTENSION ::= {
    EXTENSION-SYNTAX    NULL,
    CRITICALITY ignore,
    IDENTIFIED BY   global:{xxxxxx}
    }
SupportedExtensions EXTENSION ::= {firstExtension -- full set of network operator extensions--}
```

7 Error procedures

The SSF states which are referred to in this clause are described in GSM 03.78 [10]. The operations PlayAnnouncement, PromptAndCollectUserInformation and SpecialisedResourceReport refer to states in the SRF SRSM which are described in ETSI ETS 300 374-1 [4] as well as to states in GSM 03.78 [10].

7.1 Operation related error procedures

7.1.1 MissingCustomerRecord

7.1.1.1 Operations SSF->SCF

InitialDP.

Procedures at invoking entity (SSF):

- SSF receives error "MissingCustomerRecord".

The CCF handles the call according to the Default Call Handling parameter of the valid CAMEL Subscription Information (CSI).

7.1.2   MissingParameter

7.1.2.1   Operations SSF -> SCF

Procedures at invoking entity (SSF).

The CCF handles the call according to the Default Call Handling parameter of the valid CSI.

7.1.3   UnknownLegID

7.1.3.1   Operations SCF->SSF

The following Call Associated/Non-call Processing operations are to be considered in addition:

-    ApplyCharging, CallInformationRequest, RequestReportBCSMEvent.

7.2   Entity related error procedures

7.2.1   Expiration of T$_{SSF}$

7.2.1.1   Procedures SSF->SCF

Procedure at the invoking entity (SSF).

The CCF handles the call according to the Default Call Handling parameter of the valid CSI.

8   Detailed operation procedures

Note that:

-    the Handoff case is not supported;

-    the support for voice recognition is optional;

-    the support for speech synthesis from text is optional;

-    for the cases of direct IP connection to the SCF and all assist cases only the procedures at the initiating SSF (together with relevant operation syntax and procedures) are specified in ETS 300 374-1 [4] as modified by this specification.

8.1   ApplyCharging procedure

8.1.1   General description

This operation is used for interacting from the SCF with the SSF function: SCF control of call duration.

The charging scenarios supported by this operation are those given in GSM 02.78 [8] for CSE control of call duration.

8.1.1.1   Parameters

-    aChBillingChargingCharacteristics.

-    this parameter specifies a list of parameters required for CSE control of call duration:

- the list may contain.

- timeDurationCharging:

- this list contains the following parameters.

- maxCallPeriodDuration:

- this parameter specifies the period of time for which a call can progress before an ApplyChargingReport shall be sent to the SCF.

- releaseIfdurationExceeded:

- this parameter specifies the action to be taken at the SSF when the duration specified above has been reached. If the parameter is present, then the call is released.

- tone:

- if the parameter is present, then a warning tone is played before the call is released.

- tariffSwitchInterval:

- this parameter indicates to the SSF the time duration until the next tariff switch. The measurement of the elapsed tariff switch period commences immediately upon successful execution of this operation.

- The parameter sendCalculationToSCPIndication is deleted.

- PartyToCharge:

- this parameter indicates a party in the call.

8.1.1.2   Normal procedure

The following precondition is not indicated in ETS 300 374-1 [4]:

SSF preconditions:

1) a control relationship exists between the SSF and the SCF;

2) in addition to ETS 300 374-1 [4] precondition the SSF may also be in the following state:

- "Monitoring".

On receipt of this operation, the SSF sets the charging data using the information elements included in the operation.

The SSF will start monitoring for the Answer event upon receipt of the ApplyCharging operation if Answer has not already been received on an outgoing connection to a Called Party, a Temporary Connection or a connection to a SRF. Upon subsequent detection of the Answer event on the outgoing connection charging is started. If the Answer event has been received from an outgoing connection already when the ApplyCharging operation is received then charging starts immediately.

Upon release of an outgoing connection to the Called Party, the Temporary Connection or the SRF connection any indication of Answer event receipt on the outgoing connection is cleared i.e. set to Answer event not received.

8.1.1.3   Error handling

Errors on "sendCalculationToSCPIndication" are not applicable.

In addition to ETS 300 374-1 [4].

TaskRefused: In addition to the generic error handling, this error shall be indicated when:

- a previously received call period duration is pending;

- a tariffSwitchInterval is indicated when a previously received tariffSwitchInterval is pending.

8.2   ApplyChargingReport procedure

8.2.1   General description

This operation is used by the SSF to report charging related information to the SCF as requested by the SCF using the ApplyCharging operation. A report shall be made either when a call disconnection event is detected by the SSF or when the SSF detects that the call period duration indicated in parameter maxCallPeriodDuration (received in ApplyCharging operation) has been reached.

8.2.1.1   Parameters

- CallResult:

    - This parameter provides the SCF with the charging related information previously requested using the ApplyCharging operation. The "CallResult" is a list, and can contain the following parameters:

        - timeDurationChargingResult.

    - This is a list, and can contain the following parameters:

        - timeInformation.

    - This is a choice of the following parameters:

        - timeIfNoTariffSwitch.

    - This parameter will be present if no tariff switch has occurred since the detection of Answer for the connection to the Called Party, Temporary Connection or SRF connection, otherwise it will be absent.
      If present, then the elapsed time since detection of Answer is reported:

        - timeIfTariffSwitch.

    - This parameter will be present if a tariff switch has occurred since the detection of Answer for the connection to the Called Party, Temporary Connection or SRF connection, otherwise it will be absent.
      If present, then the parameter may contain the following information:

        - timeSinceLastTariffSwitch.

    - The elapsed time since detection of the last tariff switch is reported:

        - tariffSwitchInterval.

    - This parameter is present only if a tariff switch was detected for the connection to the Called Party, the temporary connection or the SRF connection in the reported call period.
      If present the time interval between either the detection of the Answer event or the previous tariff switch (whichever of these events was last detected) and the last tariff switch is reported:

        - partyToCharge.

    - The "partyToCharge" parameter as received in the related ApplyCharging operation or deduced from the default value, to correlate the result to the request.

    - CallActive.

    - This parameter indicates whether the call is still active or has been released.

8.2.2   Invoking entity (SSF)

8.2.2.1   Normal procedure

SSF preconditions:

1) a relationship exists between the SSF and the SCF;

2) a charging event has been detected that was requested by the SCF via an ApplyCharging operation or a Called Party, Temporary Connection or SRF disconnection event has occurred.

SSF postconditions:

1) if release of the call has occurred because the allowed call duration has been reached:

   - all outstanding EDPs shall be disarmed;

   - applyChargingReport shall be sent to SCF followed by any outstanding CallInformationReports, if applicable;

   - the SSF shall transit to the 'Idle' state.

2) if release of the call has occurred but not because the allowed call duration has been reached:

   - if there are any outstanding EDPs or other reports then the SSF shall remain in the same state; else

   - the SSF shall transit to the 'Idle' state.

This operation is invoked if a charging event has been detected that was requested by the SCF.

8.3   AssistRequestInstructions procedure

8.3.1   General description

8.3.1.1   Parameters

- iPSSPCapabilities:

   This parameter is applicable to this operation also in the physical scenarios corresponding to the direct case. Indicates which SRF resources are attached, available and supported within:

   - the SSP where the SSF resides, or

   - the IP where the SRF resides.

8.4   CallInformationReport procedure

8.4.1   General description

This operation is used to send specific call information for a single call party to the gsmSCF as requested by the gsmSCF in a previous CallInformationRequest operation. The report is sent at the end of a call/call party connection which is indicated by one of the events specified below.

8.4.1.1   Parameters

In addition to ETS 300 374-1 [4]:

-   legID:

    -   this parameter indicates the party in the call for which the information has been collected. When absent, it indicates the 'outgoing' leg created with Connect or Continue.

8.4.1.2   Normal procedure

The following SSF precondition is not necessary (e.g. SSF releases the call, user busy):

    1) at least one party disconnects from a call.

and shall be replaced by:

    2) the indicated or default call party is released from the call or call set-up towards the indicated or default call party is not completed.

The following complete paragraph is leg related instead of call and call party related.

If the SSF executes a state transition caused by one of the following events:

-   Release of the indicated or default leg;

-   Abandon of the indicated leg;

-   Busy or Not Reachable for the indicated or default leg;

-   SSF no answer timer expiration for the indicated or default leg;

-   route select failure for the indicated or default leg;

-   release call initiated by the SCF;

and a CallInformationRequest is pending for the indicated or default leg then the CallInformationReport operation is sent to the SCF containing all information requested for that leg.

If a CallInformationReport has been sent to the SCF for a leg then no CallInformationReport is pending on that leg, i.e. a further CallInformationReport for that leg, e.g. in the case of follow-on, has to be explicitly requested by the SCF.

8.5   CallInformationRequest procedure

8.5.1   General description

8.5.1.1   Parameters

The callAttemptElapsedTime parameter is used to indicate the duration between the end of CAP processing of operations initiating call set-up ("Connect" or "Continue") and the received answer indication from the called party side. For the Calling Party this parameter shall be set to 0.

For a Calling Party the callConnectedElapsedTime parameter indicates the duration between the sending of IDP and the release of that party.

In addition to ETS 300 374-1 [4]:

-   legID:

    -   this parameter indicates the party in the call for which information shall be collected and at the end of connection of which the report shall be sent. When absent, it indicates the 'outgoing' leg created with Connect or Continue.

8.6   Connect procedure

8.6.1   General description

This operation is used to request the SSF to perform the call processing actions to route a call to a specific destination or to influence other call set-up information, e.g. the Generic Number.

The Connect operation may be received in both the O-BCSM and the T-BCSM.

8.6.1.1   Parameters

The parameter originalCalledPartyID carries the dialled digits only if the call is forwarded by the SCF:

- alertingPattern:

    - this parameter indicates the type of alerting to be applied. It is defined in ETS 300 974 [6].

The following parameters are defined in addition to ETS 300 374-1 [4].

- genericNumbers:

    - this parameter allows the SCF to set the Generic Number parameter used in the network. It is used for transfer of Additional Calling Party Number.

- suppressionOfAnnouncement:

    - this parameter indicates that announcements and tones which are played in the exchange at non-successful call set-up attempts shall be suppressed.

- oCSIApplicable:

    - this parameter indicates to the SSP in which the T-BCSM is instantiated that the OCSI, if present, shall be applied on the outgoing call leg created with the Connect operation.

- naCarrierInformation:

    - this parameter contains carrier identification code and carrier selection type to be used by gsmSSF for routing a call to a carrier.

- naOliInfo:

    - this parameter contains originating line information which identifies the charged party number type to the carrier.

- naChargeNumber:

    - this parameter identifies the chargeable number for the usage of a carrier.

8.6.2   Responding entity (SSF)

8.6.2.1   Normal procedure

The SSF precondition (1) is as follows:

    1) originating or terminating call attempt has been initiated.

The SSF postconditions (2) and (3) are not stated.

For the O-BCSM the PIC is after DP2 Collected Information; for T-BCSM it is after DP12 Terminating Atempt Authorized.

If the Connect operation received in the T-BCSM contains the OCSIApplicable flag then a new O-BCSM with a new control relationship is created for this user. The old T-BCSM and the new O-BCSM are linked by an internal interface which is assumed to behave in a similar way to an ISUP interface. The old and the new relationships may exist simultaneously.

NOTE: An O-BCSM is also created if GSM call forwarding applies and the user has an active OCSI.

8.7   ConnectToResource procedure

8.7.1   General description

8.7.1.1   Parameters

The following parameter is defined instead of the parameter serviceInteractionIndicators of ETS 300 374-1 [4].

- serviceInteractionIndicatorsTwo:

    - this parameter contains an indicator sent from the SCF to the SSF, for control of the through connection to the Calling Party from the SRF. Note that the Assisting SSF shall always assume that Bothway Throughconnection is required, and hence will ignore this parameter if received.

8.8   EstablishTemporaryConnection procedure

8.8.1   General description

8.8.1.1   Parameters

The following parameter is defined instead of the parameter serviceInteractionIndicators of ETS 300 374-1 [4].

- serviceInteractionIndicatorsTwo:

    - this parameter contains an indicator sent from the SCF to the SSF for control of the through connection to the Calling Party.

The following parameters are defined in addition to ETS 300 374-1 [4].

- naCarrierInformation:

    - this parameter contains carrier identification code and carrier selection type to be used by gsmSSF for routing a call to a carrier.

- naOliInfo:

    - this parameter contains originating line information which identifies the charged party number type to the carrier.

- naChargeNumber:

    - this parameter identifies the chargeable number for the usage of a carrier.

8.8.1.2   Error handling

The following note is included in addition to ETS 300 374-1 [4].

NOTE: The connection set-up may fail if CorrelationID or SCFiD are not supported as separate ISUP parameters. The error ETCFailed will be returned if SCFiD or CorrelationID are not supported in the SSF.

8.9   EventReportBCSM procedure

8.9.1   General description

For the parameter eventSpecificInformationBCSM the following is clarified.

- eventSpecificInformationBCSM:
  This parameter indicates the call related information specific to the event.

  For RouteSelectFailure it will contain the "FailureCause", if available.

  For O-Busy it will contain the "BusyCause", if available.

  If the busy event is triggered by an ISUP release message, the BusyCause is a copy of the ISUP release cause, for example: Subscriber absent, 20 or User busy, 17.

  If the Busy event is triggered by a MAP error, for example : Absent subscriber, received from the HLR, the MAP cause is mapped to the corresponding ISUP release cause.

  Note: If no BusyCause is received, the gsmSCF should assume busy.

  For T-Busy it will contain the "BusyCause", if available.

  If the busy event is triggered by an ISUP release message, the BusyCause is a copy of the ISUP release cause, for example : Subscriber absent, 20 or User busy, 17.

  If the Busy event is triggered by a MAP error, for example : Absent subscriber, received from the HLR, the MAP cause is mapped to the corresponding ISUP release cause.

NOTE: If no BusyCause is received, the gsmSCF should assume busy.

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

  For O-NoAnswer it will be empty.

  For T-NoAnswer it may contain the CallForwarded indication.

  If the no answer event is triggered by an ISUP release message or expiry of the CAMEL timer TNRy, the eventSpecificInformationBCSM will be empty.

  If the no answer event is triggered by call forwarding at the GMSC, the eventSpecificInformationBCSM will contain the CallForwarded indication.

  For O- or T-Answer it will be empty.

  For O- or T-Disconnect it will contain the "releaseCause", if available.

The following parameter is defined in addition to ETS 300 374-1 [4].

- gmscAddress:

  This parameter gives the mscId assigned to the GMSC. For encoding see GSM 09.02 [6].

8.9.2   Invoking entity (SSF)

8.9.2.1   Normal procedure

There are no service features to reuse the same O-BCSM.

8.9.2.2   Error handling

In case the message type is request, on expiration of T_{SSF} before receiving any operation, the SSF aborts the interaction with the SCF and instructs the CCF to handle the call according to the Default Call Handling parameter of the valid CSI.

8.10   FurnishChargingInformation procedure

8.10.1   General description

The use of the FurnishChargingInformation procedure is defined as follows:

-    this operation is used to send charge related information to a logical call record. This logical call record is CAMEL specific. The first FCI of a call leg leads to the generation of a logical call record. Receipt of subsequent FCIs on the same leg shall overwrite the contents of the logical call record. When additional FCIs are to be used an EDP-R shall be armed in order to be able to apply FCI before the termination of the call record generation.

-    if an FCI operation is received for the called party when the SSF is in state 'Monitoring', or is suspended in one of the following DPs then the charging information shall be included in the logical call record for the leg that has been or is to be established:

    -    Collected_Info;

    -    O_Answer;

    -    Terminating_Attempt_Authorised; or

    -    T_Answer.

If an FCI operation is received for the called party when the SSF is suspended in any other DP then the charging information shall be included in the logical call record created for the last failed or disconnected called party.

8.10.1.1   Parameters

-    FCIBillingChargingCharacteristics:

    -    for CAMEL this parameter contains the following sub-parameters.

-    FCIBCCCAMELsequence1:

    -    this parameter contains the following sub-parameters.

-    FreeFormatData:

    -    this parameter indicates free-format billing and/or charging characteristics.

-    PartyToCharge:

    -    this parameter indicates the party to bill and/or charge.

8.10.2   Responding entity (SSF)

8.10.2.1   Normal procedure

SSF preconditions:

-    The FurnishChargingInformation operation may also be received in the state "Monitoring".

The use of the FurnishChargingInformation procedure is defined as follows.

On receipt of this operation the SSF performs actions to create the call record if necessary, and writes the free-format information carried in the operation into the call record. Note that an FCI operation will create a Logical Call Data Record (CDR) if such a record does not already exist for the indicated leg. Subsequent FCI operations received for a given leg, before a disconnection event has been received from or propagated to that leg, will overwrite the data previously written in the free-format CDR field.

The Logical CDRs will be associated for a given call into one or more physical CDRs, as specified in GSM 12.05.

A logical CDR is output when a disconnection event is propagated to the Leg associated with it, or when a Connect operation to create a connection to a Follow-on Called Party is received. I.e. subsequent FCIs indicating the calling leg (leg1) override data from previously received FCI(s) indicating that calling leg during that entire call or call attempt. Subsequent FCIs indicating the called leg (leg2) override any previously received data from an FCI indicating that called leg until the called leg representing that particular called party number is released from or releases the call. When a new called party is created as a result of a follow-on call, and an FCI indicating the called leg is received, then a new CAMEL Logical CDR is created for that portion of the call. From then on, any subsequent FCIs for the called party override the data from any previous FCI for the called leg presenting that particular called party number; however, CAMEL Logical CDR(s) that have been output already are not affected.

It should be noted that no CAMEL Logical CDR is output at the end of a user interaction.

8.11 InitialDP procedure

8.11.1 General description

8.11.1.1 Parameters

The following parameters are defined in addition to ETS 300 374-1 [4].

- calledPartyNumber:

    - this parameter shall not be used for originating calls.

- iMSI:

    - IMSI of the mobile subscriber for which the service is invoked. For encoding see ETS 300 974 [6].

- subscriberState:

    - the state of the mobile subscriber for which the service is invoked. The possible states are Busy, Idle, Not reachable and Not provided from VLR. For encoding see ETS 300 974 [6].

- locationInformation:

    - this parameter indicates the whereabouts of the MS, and the age of the information defining the whereabouts. For encoding see ETS 300 974 [6].

- ext-BasicServiceCode:

    - indicates the Basic Service Code. For encoding see ETS 300 974 [6].

- callReferenceNumber:

    - this parameter gives the network call reference number assigned to the call by the CCF. For encoding see ETS 300 974 [6].

- mscAddress:

  - this parameter gives the mscId assigned to the GMSC/MSC. For encoding see ETS 300 974 [6].

- calledPartyBCDNumber:

  - this parameter contains the number used to identify the called party in the forward direction. It may also include service selection information, including * and # character. This parameter shall be sent only in the originating case.

- timeAndTimezone:

  - this parameter contains the time that the SSF was triggered, and the time zone that the invoking SSF resides in.

- gsm-ForwardingPending:

  - this parameter indicates that a forwarded-to-number was received and the call will be forwarded due to GSM supplementary service call forwarding in the GMSC.

- naCarrierInformation:

  - this parameter contains the carrier identification code and carrier selection type associated with the calling subscriber of a mobile originating call, the called subscriber of a mobile terminating call or the forwarding subscriber of a mobile fowarded call.

8.11.2   Invoking entity (SSF)

8.11.2.1   Normal procedure

The address of the SCF the InitialDP operation shall be sent to is fetched from the valid CSI. The SSF provides all available parameters.

8.11.2.2   Error handling

If the destination SCF is not accessible then the SSF instructs the CCF to handle the call according to the Default Call Handling parameter of the valid CSI.

On expiration of T_{SSF} before receiving any operation, the SSF aborts the interaction with the SCF and instructs the CCF to handle the call according to the Default Call Handling parameter of the valid CSI.

8.12   PlayAnnouncement procedure

8.12.1   General description

This operation is used for inband interaction with a GSM user.

8.13   PromptAndCollectUserInformation procedure

8.13.1   General description

This operation is used to interact with the calling party in order to collect information.

8.13.1.1   Parameters

- collectedInfo:

    - collectedDigits:

        - startDigit:

            - in addition to ETS 300 374-1 [4]: When the end of input is attained, the collected digits are sent from SRF to the SCF, including the 'startDigit' if received by the SRF.

8.13.2   Responding entity (SRF)

8.13.2.1   Normal procedure

The assistance given to the end-user in the form of a network dependent default announcement is not context specific.

The following is in additon to ETS 300 374-1 [4].

The receipt of any 'endOfInput' condition (maximumNbOfDigits, endOfReplyDigit, cancelDigit, firstDigitTimeout, interDigitTimeout) terminates immediately the ongoing input.

> NOTE: In other words when e.g an endOfReplyDigit is received, the receipt of a subsequent cancelDigit will not be processed anymore.

8.14   ReleaseCall procedure

8.14.1   General description

This operation is used to tear down by the SCF an existing call at any phase of the call for all parties involved in the call. The operation may only be sent within a control relationship and is not allowed in a monitor relationship. This operation shall not be sent to an assisting SSF.

8.15   RequestReportBCSMEvent procedure

8.15.1   General description

> NOTE 1:   In state "monitoring" only requests to disarm detection points (with MonitorMode set to "Transparent") or send notifications of events (with MonitorMode set to "NotifyAndContinue") is accepted.

> NOTE 2:   If the RequestReportBCSMEvent requests arming of the current DP from which the call processing was suspended, the next occurrence of the DP encountered during BCSM processing will be detected (i.e. not the current one from which the call was suspended).

The DP arming principle is as follows:

- the DPs O_Disconnect, T_Disconnect can be armed as well as for the controlling as passive legs depending on what direction (either from the party which is connected to the controlling or passive leg) events have to be captured. As an example the Disconnect DP can be armed as well as for the controlling leg and the passive leg, in that case if a release request is received from the user it will be detected by the Disconnect DP armed for the controlling leg, while a release request from the remote parties shall be detected by arming the relevant passive leg Disconnect DP;

- the O_Abondon DP can only be armed for the controlling leg in the O_BCSM and the T_Abandon can only be armed for the passive leg in the T_BCSM;

- all DPs that can occur before PIC-'Analyse, Routing & Alerting' in the O_BCSM are allowed for controlling leg only;

- all DPs that can occur before PIC-'Terminating Call Handling' in the T_BCSM are allowed for passive legs only;

- the DP-Analysed-Information is allowed for controlling and passive legs;

- all other DPs for which no filtering applies arming is allowed in the O_BCSM for passive legs only and in the T_BCSM for controlling leg only.

Table 1A: DP Arming Table for O-BCSM

O_BCSM	Controlling leg	Passive leg)	Default leg ID
Collected_Information DP **o1)**	-	-	-
Route_Select_Failure DP	-	X	2
O_Called_Party_Busy DP	-	X	2
O_No_Answer DP	-	X	2
O_Answer DP	-	X	2
O_Disconnect DP	X	X	- **o2)**
O_Abandon DP	X	-	1
o1) Only applicable as TDP, because this is the first DP that can be encountered and CollectInformation is not used by CAMEL. Since the CollectInformation operation is not used this DP can not be armed as an EDP.			
o2) The "legID" parameter shall be included.			
Nomenclature: X = Arming Applicable			
- = Not Applicable			

Table 2: DP Arming Table for T-BCSM

T_BCSM	Controlling leg	Passive leg	Default Leg ID
Terminating_Attempt_Authorized DP **t1)**	-	-	-
T_Busy DP	X	-	2
T_No_Answer DP	X	-	2
T_Answer DP	X	-	2
T_Disconnect DP	X	X	- **t2)**
T_Abandon DP	-	X **t3)**	1
t1) Only applicable as TDP, because first DP that can be encountered cannot be armed as EDP.			
t2) The "legID " parameter shall be included.			
t3) T_Abandon can only be armed for the passive leg.			
Nomenclature: X = Arming Applicable			
- = Not Applicable			

8.15.1.1 Parameters

The value of collectedInfo is not valid in the eventTypeBCSM parameter.

The legID of the sendingSideID shall be assumed as defined in subclause 4.5 "Definition and usage of LegID" of this standard.

The "legID" = 2 for the sendingSideID is also used to indicate a party that was created with a Continue operation.

- sendingSideID:

  - if not included, the following defaults are assumed for LegID:

    - "legID" = 2 for the events RouteSelectFailure, O-CalledPartyBusy, O-NoAnswer, O-Answer, T-CalledPartyBusy, T-NoAnswer and T-Answer.

8.15.2   Responding entity (SSF)

8.15.2.1   Normal procedure

additional SSF precondition:

1) a control relationship exists between the SSF and the SCF.

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

8.16   SendChargingInformation procedure

8.16.1   General description

The SendChargingInformation procedure is defined as follows:

- this operation is used to instruct the SSF on the advice of charge information to be sent by the SSF. The SCI operation may be invoked on multiple occasions.

8.16.1.1   Parameters

- sCIBillingChargingCharacteristics:

    - this parameter is a choice between two lists of information.

The first list shall only be sent before an answer event has been detected from the current Called Party, Temporary Connection or connection to an SRF. It contains the following parameters:

- aOCBeforeAnswer:

    - this is a list of the following information.

- aOCInitial:

    - this is a set of GSM Charge Advice Information elements, as defined in GSM 02.24 [7], and these CAI elements are sent by the SSF to the Mobile station when an ANSWER is received and a tariff switch has not yet occurred.

- aOCSubsequent:

    - this list may indicate the following information.

- CAIElements:

    - this is a set of GSM Charge Advice Information elements, as defined in GSM 02.24 [7], and these CAI elements are sent to the Mobile station when Answer is detected and a tariff switch has occurred previously, or when Answer has previously been detected and a tariff switch of a call occurs.

- tariffSwitchInterval:

    - this parameter indicates to the SSF the time duration until the next tariff switch. The measurement of the elapsed tariff switch period commences immediately upon successful execution of this operation.

The second list in the Choice shall only be sent after an answer event has been detected from the current Called Party, Temporary Connection or connection to an SRF. It contains the following parameters:

- aOCAfterAnswer:

    - This list may indicate the following information.

- cAIElements:

- this is a set of GSM Charge Advice Information elements, as defined in GSM 02.24 [7], and these CAI elements are sent to the Mobile station by the SSF when Answer is detected and a tariff switch has occurred previously, or when Answer has previously been detected and a tariff switch occurs in the call.

- tariffSwitchInterval:

  - this parameter indicates to the SSF the time duration until the next tariff switch. The measurement of the elapsed tariff switch period commences immediately upon successful execution of this operation.

- legID:

  - this parameter indicates where the charging information shall be sent. The legID shall be set to 1.

8.16.2   Responding entity (SSF)

8.16.2.1   Normal procedure

The normal procedure is as follows. The precondition and the post condition of ETS 300 374-1 [4] are applicable.

On receipt of this operation the SSF performs actions to send the advice of charge information to the indicated Call Partys Mobile Station.

If advice of charge is to be provided to a GSM Mobile Station in conjunction with CSE control of call duration then the following sequence of operations shall be sent from the SCF to the SSF in the following order, in the same TCAP TC-CONTINUE component:

- ApplyCharging; SendChargingInformation.

These operations will be processd sequentially by the SSF, in the order that they are sent by the SCF. Note also that in this case parameter TariffSwitchInterval may be present in either in the ApplyCharging operation or the SendChargingInformation operation, but not in both operations. It is recommended that it shall be transported in the ApplyCharging operation.

The TariffSwitchInterval information received with either of these operations shall set the same tariff switch timer in the SSF, and this duration timer shall run from the time of successful operation execution.

8.16.2.2   Error handling

TaskRefused: In addition to the generic error handling noted below, this error shall be indicated when:

- a tariffSwitchInterval is indicated when a previously received tariffSwitchInterval is pending.

Generic error handling for the operation related errors is described in Clause 8 and the TCAP services which are used for reporting operation errors are described in Clause 10.

9   Services assumed from TCAP

9.1   Normal procedures

The basic end can also be used by the SSF:

- if the SSF has no pending operations or reports to process and no armed detection points which could be triggered, then a TC-END request primitive (basic) with zero components can be sent from the SSF.

9.1.1   SSF/SRF-to-SCF messages

The following is deleted:

- in all other situations the dialogue shall no longer be maintained. I.e. the error or reject shall be transmitted with a TC-END request primitive, basic end, if the erroneous component was received with a TC-BEGIN indication primitive.

9.1.2   Receipt of a TC-BEGIN indication

The following note is included.

NOTE: If the SSF provides an AC which is not acceptable to the SCF, then an alternate AC should not be returned.

9.1.3   Receipt of a TC-U-ABORT indication

The following note is included.

NOTE: If an alternate application context is offered to the SSF, it should not attempt to establish a new dialogue.

9.1.4   Operation invocation receipt

The following is deleted:

If a linked ID is included, perform the following checks: If the operation referred to by the linked ID does not allow linked operations or if the operation code does not correspond to a permitted linked operation, or if the parent operation invocation is not active, issue a TC-U-REJECT request primitive with the appropriate problem code (linked response unexpected or unexpected linked operation).

9.2   Mapping on to TC services

9.2.1   Dialogue control

9.2.1.1   User information

In addition: The receiving side may ignore this parameter if received. The User Information parameter shall be encoded in accordance with the definition provided in ITU-T Recommendation Q.773 [18] (subclause 3.2) and the definition of EXTERNAL type provided in ITU-T Recommendation X.690 [24], with the restriction that an Object Identifier shall always be present to identify the user information and the entity which sent it.

9.2.1.2   Quality of service

The quality of service of TC request primitives is set by the SACF to the following value:

- sequencing requested if required by the application (see subclause 4.4.2);

- return option as required by the application (see subclause 4.4.2).

Annex A (normative):
Mapping between CAMEL and ISUP

This annex defines the mapping between the CAMEL parameters and the call parameters sent/received in the ISUP. The functional handling of these parameters is defined in GSM 03.78 [10].

A.1   InitialDP operation

Table A.1

ISUP message IAM (Note 1)	CAMEL operation InitialDP
Called party number	calledPartyNumber
Calling party number	callingPartyNumber
Calling party's category	callingPartysCategory
Location number	locationNumber
Original called number	originalCalledPartyID
User teleservice information (1st priority) High layer compatibility IE contained in access transport (2nd priority) (Note 2)	highLayerCompatibility
Generic number 'additional calling party number'	additionalCallingPartyNumber
User service information prime (1st priority) User service information (2nd priority)	bearerCapability
Redirecting number	redirectingPartyID
Redirection information	redirectionInformation
NOTE 1: Optional parameters may be absent, i.e. they are only mapped, if these parameters are available at the DP. NOTE 2: If two high layer compatibility information elements are contained in the access transport parameter, then the second information element, carrying the preferred HLC, is mapped to the CAMEL highLayerCompatibility parameter.	

A.2   Connect operation

On receipt of a Connect operation from the SCF the called party number used for routing is derived from the destinationRoutingAddress (see Table A.2). If the triggering of the CAMEL service was made for a mobile terminating or forwarded call, an ACM message shall be sent to the preceding exchange. The encoding of the backward call indicators in the ACM is specified in GSM 09.12.

Table A.2 illustrates the mapping of parameters received in the Connect operation to parameters sent in the IAM message to the succeeding exchange. Parameters which were received in the IAM and are not replaced by parameters of the Connect operation are treated according to the normal procedures.

On sending of the IAM the awaiting address complete timer is started. If the timer expires the call is released in both directions and an appropriate indication is returned to the calling subscriber.

Table A.2

CAMEL operation Connect (Note 1)	ISUP message IAM
destinationRoutingAddress	Called party number
originalCalledPartyID	Original called number
callingPartysCategory	Calling party's category
redirectingPartyID	Redirecting number
redirectionInformation	Redirection information
genericNumbers	Generic number (Note 2)
NOTE 1: Optional parameters may be absent, i.e. they are only mapped, if received. NOTE 2: The set of generic numbers received in the genericNumbers parameter is mapped to the appropriate number of Generic Number parameters in the ISUP IAM. This shall be performed irrespective of the value of the screening indicator in the ISUP calling party number.	

A.3   AssistRequestInstructions operation

If an IAM is received at an assisting SSP containing a SSF or an IP containing a SRF then an AssistRequestInstructions operation is sent to the SCF. The correlationID parameter in the AssistRequestInstructions operation can contain:

  a) the CorrelationID digits extracted from the IAM Called Party Number;

  b) the whole Called Party Number received in the ISUP IAM (CorrelationID digits extracted at SCF);

  c) the contents of the ISUP IAM CorrelationID parameter.

In the case where the SCF and the assisting SSF are both in the HPLMN and ISUP 97 is supported then any of these mechanisms may be used.

In the case where the SCF and the assisting SSF are both in the HPLMN and ISUP 97 is not supported then mechanisms a) and b) may be used.

In the case where the SCF is in the HPLMN and the assisting SSF is in the VPLMN then only mechanism b) may be used when an all-ISUP 97 signalling path cannot be guaranteed. Mechanism a) may be used if bilateral agreements on the format of the information transferred in the ISUP IAM Called Party Number are defined between the HPLMN and VPLMN.

In the case where the SCF is in the HPLMN and the assisting SSF is in the VPLMN then mechanism c) only may be used if an all-ISUP 97 signalling path can be guaranteed between the HPLMN and the VPLMN.

A.4   ConnectToResource operation

On receipt of a ConnectToResource operation from the SCF the IP is connected to the incoming call, to facilitate User Interactive dialogue with the user.

If the User Interactive dialogue is to be performed at a forwarding MSC or GMSC then an ACM message shall be sent to the preceding exchange. The encoding of the backward call indicators in the ACM is specified in GSM 09.12, with the Optional Backward Call Indicators indicating 'in-band information or an appropriate pattern is now available'.

If the User Interactive dialogue is to be performed at a forwarding MSC or GMSC then when the IP indicates through-connection and the ConnectToResource operation indicates that a bothway throughconnection is required an ANM message shall be sent to the preceding exchange if answer has not previously been sent. As a network operator/equipment vendor option a CPG message may be sent if ANM has already been sent.

A.5   EstablishTemporaryConnection operation

On receipt of an EstablishTemporaryConnection operation from the SCF then if the triggering of the CAMEL service was made for a mobile terminating or forwarded call an ACM message shall be sent to the preceding exchange. The encoding of the backward call indicators in the ACM is specified in GSM 09.12. In addition, an ISUP IAM shall be sent to the succeeding exchange.

Table A.3 illustrates the mapping of parameters received in the EstablishTemporaryConnection operation to parameters sent in the IAM message to the succeeding exchange. On sending of the IAM the awaiting address complete timer is started. If the timer expires the call is released in both directions and an appropriate indication is returned to the calling subscriber.

Table A.3

CAMEL operation EstablishTemporaryConnection (Note 1)	ISUP message IAM
assistingSSPIPRoutingAddress	Called party number
correlationID	Correlation id (note 1)
scfId	SCF id (note 1)
NOTE 1: These optional parameters may be absent, i.e. they are only mapped, if received. If they are received and cannot be mapped then an error is sent to the SCF as detailed in subclause 9.15.	
NOTE 2: The AssistingSSPIPRoutingAddress parameter may also include a Hex B digit, in order to delineate the boundary between digits used for routing and digits forming part of the SCFiD and/or CorrelationID.	

Except for the Called Party Number the remaining mandatory IAM parameters are set as follows:

   a) Nature of connection indicators:

      -   Satellite indicator: set as in an Originating MSC;

      -   Continuity check indicator: set as in Originating MSC;

      -   Echo control device indicator: set as in Originating MSC.

   b) Forward Call Indicators:

      -   National/international call indicator: set as in Originating MSC;

      -   End-to-end method indicator: 00 (no end-to-end method   available);

      -   Interworking indicator: 0 (no interworking encountered);

      -   End-to-end information indicator: 0 (no end-to-end information available);

      -   ISDN User Part indicator: 1 (ISDN User Part used all the way);

      -   ISDN User Part preference indicator: 00 (ISDN User Part preferred all the way);

      -   ISDN access indicator: 0 (originating access non-ISDN);

      -   SCCP method indicator: 00 (no indication).

   c) alling Party's Category:

      -   00001010   (ordinary subscriber).

   d) Transmission Medium Requirement:

      -   00000011   (3,1 kHz audio).

The ISUP IAM optional parameter Propagation Delay Counter is set as in an Originating MSC.

# A.6	ReleaseCall operation

Upon receipt of the ReleaseCall operation, the GMSC/SSF (VMSC/SSF) sends REL messages in both directions. The cause indicators parameter contains the releaseCallArg parameter of the ReleaseCall operation.

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

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