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Source: **SA1**

Title: **CR to 22.078 on Support for CAMEL Trunk Originated Trigger Detection Points (Rel-7)**

Document for: **Approval**

Agenda Item: **7.1.3**

Meeting	SA Doc	TS No.	CR No	Rev	Rel	Cat	Subject	Vers. Current	Vers New	SA1 Doc
SP-27	SP-050064	22.078	182	1	Rel-7	B	Support for CAMEL Trunk Originated Trigger Detection Points	7.2.0	7.3.0	S1-050244

CR-Form-v7

CHANGE REQUEST

⌘ **22.078** **CR** **182** ⌘ **rev** **1** ⌘ Current version: **7.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Support for CAMEL Trunk Originated Trigger Detection Points
Source:	⌘	SA1 (Nortel, Nokia)
Work item code:	⌘	TTCAMEL
Date:	⌘	21/12/2004
Category:	⌘	**B**
Release:	⌘	Rel-7

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	To enable CSE interaction for calls received over a trunk interface at the MSC. This capability has application in CAMEL-based IN networks to allow (public and private) trunk access to CSE-based services.
Summary of change:	⌘	Definition of CAMEL procedures for trunk originated services.
Consequences if not approved:	⌘	Operators have to use proprietary solutions that restrict multi-vendor interoperability.

Clauses affected:	⌘	1, 3, 4, 8, 14, 15, X(new section)			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	23.078, 29.078
		X	Test specifications		
			O&M Specifications		
Other comments:	⌘				

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

FIRST MODIFIED SECTION

1 Scope

This standard specifies the stage 1 description for the CAMEL feature (Customised Applications for Mobile network Enhanced Logic) which provides the mechanisms to support services consistently independently of the serving network. The CAMEL features shall facilitate service control of operator specific services external from the serving PLMN. The CAMEL feature is a network feature and not a supplementary service. It is a tool to help the network operator to provide the subscribers with the operator specific services even when roaming outside the HPLMN.

If an IPLMN or VPLMN supports CAMEL Phase 4, it shall also provide the functionality of all previous CAMEL phases.

Phase 4 network signalling shall support interworking with CAMEL Phases 3 and 2.

The CAMEL feature is applicable

- To mobile originated and mobile terminated call related activities;
- To supplementary service invocations;
- To SMS MO, to GPRS sessions and PDP contexts, to the control of HLR subscriber data, to the control of network signalling load.

The mechanism described addresses especially the need for information exchange among the VPLMN, HPLMN and the CAMEL Service Environment (CSE) for support of such operator specific services. Any user procedures for operator specific services are outside the scope of this standard.

This specification describes the interactions between the functions of the VPLMN, HPLMN, IPLMN and the CSE.

The second phase of CAMEL enhances the capabilities of phase 1 where the following capabilities have been added:

- Additional event detection points;
- Interaction between a user and a service using announcements, voice prompting and information collection via in band interaction or USSD interaction;
- Control of call duration and transfer of Advice of Charge Information to the mobile station;
- The CSE can be informed about the invocation of the supplementary services ECT, CD and MPTY;
- For easier post-processing, charging information from a serving node can be integrated in normal call records.

The third phase of CAMEL enhances the capabilities of phase 2. The following capabilities are added:

- Support of facilities to avoid overload;
- Capabilities to support Dialled Services;
- Capabilities to handle mobility events, such as (Not-)reachability and roaming;
- Control of GPRS sessions and PDP contexts;
- Control of mobile originating SMS through both circuit switched and packet switched serving network entities.
- Interworking with SoLSA. (Support of Localised Service Area). Support for this interworking is optional.
- The CSE can be informed about the invocation of the supplementary services CCBS.

Detailed information is given in the respective sections.

The fourth phase of CAMEL enhances the capabilities of phase 3. The following capabilities are added:

- CAMEL support for Optimal Routeing of circuit-switched mobile-to-mobile calls;
- The capability for the CSE to create additional parties in an existing call;
- The capability for the CSE to create a new call unrelated to any other existing call;
- Capabilities for the enhanced handling of call party connections;
- The capability for the CSE to control sessions in the IP Multimedia Subsystem.
- Enhanced CSE capability for Dialled Services.
- The capability to report basic service changes during ongoing call.
- The CSE capability to select between preferred and less preferred bearer service.
- The capability for the CSE to control trunk originated calls.
- The capability for the CSE to request additional dialled digits.

With CAMEL Phase 4, it is possible that only a limited subset of the new functionalities is supported, in addition to the complete support of CAMEL Phase 3.

NEXT MODIFIED SECTION

3 Definitions and abbreviations

Operator Specific Service (OSS): Any non-standardised service offered to a mobile user.

Interrogating PLMN (IPLMN): The PLMN which interrogates the HPLMN for information to handle a mobile terminating call.

CAMEL Service Environment (CSE): A CSE is a logical entity which processes activities related to Operator Specific Services (OSS).

Route select failure: A condition when routeing to the called party fails. Route Select Failure can be reported in an existing relationship or a new relationship can be initiated.

Service event: A specific event of a process which may be used as part of an operator specific service.

Initial service event: A service event which triggers the establishment of a relationship between the CSE and the controlled entity.

Subsequent service event: A service event which is reported in the context of an existing relationship between the CSE and the reporting entity.

Service procedure: A part of the CAMEL feature to be used when a specific CAMEL service event is detected.

Network CAMEL Service Information (N-CSI): Identifies services offered by the serving PLMN operator equally for all subscribers.

NOTE: These services may also be provided using a technology other than CAMEL.

CAMEL Subscription Information (CSI): Identifies that CAMEL support is required for the subscriber and the identities of the CSEs to be used for that support. The CSI also contains information related to the OSS of the subscriber, e.g. Service Key.

The OSS may include both services provisioned for individual subscribers and services provisioned equally for all users of a VPLMN.

Location Area Code: Indicates the global identity of that part of the service area of a VLR in which the subscriber is currently located, and in which the subscriber will be paged for mobile terminated traffic

Location Information: The location information shall be an identification of the location of the served subscriber.

The following location information shall be sent to the CSE (if available):

- **Geographical information** indicates the location (latitude and longitude) of the served subscriber. When Cell ID or Location Area Code is known the latitude and longitude may be calculated as the nominal central point of the cell or of the location area; alternative mechanisms for determining latitude and longitude may also be supported. The uncertainty of the indicated location is part of the geographical information.

- **Geodetic Information** provides the same functional capability as geographical information; however it is encoded differently.

- **Cell ID** indicates the global identity of the current or last cell which the subscriber is using or has used if the subscriber is using GERAN. The VPLMN shall update the stored Cell ID at establishment of every radio connection and whenever the subscriber is handed over between cells.

- **Routing Area ID** indicates the global identity of the current or last GPRS routing area which the subscriber is using or has used if the subscriber is using GERAN radio access in a GPRS serving network.

- **Service Area ID** indicates the global identity of the current or last service area which the subscriber is using or has used if the subscriber is using UTRAN radio access. The VPLMN shall update the stored Service Area ID at establishment of every radio connection and whenever the subscriber is handed over between service areas.

- **VLR number** is the number of the serving VLR stored in the HPLMN.

- **Location status** indicates whether or not the location information has been confirmed by radio contact. If the location information has not been confirmed by radio contact a time stamp is sent indicating the time elapsed since the last radio contact with the subscriber.

- **Location number** is the number received on the incoming circuit (for an incoming call) or to be sent on the outgoing circuit (for an outgoing call).

Service Key: An identifier of the OSS which shall be transparent to the IPLMN/VPLMN.

Subscriber Status: An indication of the status of a subscriber, determined by the state of the subscriber's MS. The subscriber status depends on the domain for which it is requested:

The **Subscriber Status in the circuit switched domain** can take one of three values:

- **CAMEL-busy**: The MS is engaged in a mobile-originated or mobile-terminated circuit-switched call.

- **Network determined not reachable**: The network can determine from its internal data that the MS is not reachable. This includes detached and purged mobile stations.

- **Assumed idle**: The MS is not CAMEL-busy or network determined not reachable.

The **Subscriber Status in the packet switched domain** can take one of five values:

- **Detached:** The network can determine from its internal data that the MS is not registered to the GPRS data network.

- **CAMEL-attached, MS not reachable for paging:** The MS is registered to the GPRS data network, but there are no PDP contexts active for this MS; the GPRS data network can determine from its internal data that the MS is not reachable for paging.

- **CAMEL-attached, MS may be reachable for paging:** The MS is registered to the GPRS data network, but there are no PDP contexts active for this MS; the GPRS data network has not determined from its internal data that the MS is not reachable for paging.

- **CAMEL-PDP context active, MS not reachable for paging:** The MS is registered to the GPRS data network, and there is at least one PDP context active for this MS; the GPRS data network can determine from its internal data that the MS is not reachable for paging. The status includes the information for each active PDP context, as specified in 3GPP TS 23.060 [13].

- **CAMEL-PDP context active, MS may be reachable for paging:** The MS is registered to the GPRS data network, and there is at least one PDP context active for this MS; the GPRS data network has not determined from its internal data that the MS is not reachable for paging. The status includes the information for each active PDP context, as specified in 3GPP TS 23.060 [13].

GPRS session: The period during which the GPRS subscriber is registered to the GPRS data network. A GPRS session starts when the GPRS subscriber attaches to the GPRS data network. It ends when the GPRS subscriber detaches from the GPRS data network.

PDP Context: A transaction for the exchange of data between an MS and a peer entity, which is addressed by the Access Point Name. A PDP context starts when the request from a GPRS subscriber successfully establishes the PDP context and ends when the subscriber deactivates the PDP context.

PDP: Packet Data Protocol (as defined in TS 22.060 [6])

Carrier Identification Code: Identifies uniquely the Carrier (NAEA).

Carrier Selection Information: An indication of whether the subscriber selected a carrier, or the carrier is predefined for the subscriber (NAEA).

Originating Line Identification: Identifies uniquely the subscriber to be charged for the usage of the carrier (NAEA).

Charge Number: Identifies uniquely the organisation to be charged for the usage of the carrier (NAEA).

North American Equal Access (NAEA): A service used in the North American region whereby a subscriber may select the carrier to be used for long distance calls.

Subscribed Dialled Services: Identifies a set of at most ten service numbers. The served subscriber can originate calls by entering a service number for the destination. This is in addition to the possibility to route calls by entering the destination number. Each service number is defined at the HPLMN operator's discretion. The set of service numbers forms part of the subscriber's profile, whether she is registered in the HPLMN or another PLMN.

Call Party Handling (CPH): A method of manipulating call legs which includes creating new parties in a call, placing individual call parties on hold, reconnecting them to the group of call parties and disconnecting individual call parties.

CPH Configuration: One or more groups of call legs that share a common dialogue to the CSE.

Call Leg: The connection joining the call party to the CPH configuration.

Call Party: A party (e.g. served subscriber, called party, PSTN subscriber etc.) in the CPH configuration.

IP multimedia session (IPMM session): See [11] for definition.

IM CN subsystem (IP Multimedia Core Network subsystem): See [11] for definition.

IM application level registration: See [12] for definition.

Trunk Originated CAMEL Service Information (TO-CSI): Identifies services offered by the PLMN operator to all incoming calls on a specific MSC trunk.

4 Description

The CAMEL network feature enables the use of Operator Specific Services (OSS) by a subscriber even when roaming outside the HPLMN.

4.1 Provision of CAMEL

CAMEL subscribers have one or more CAMEL Subscription Information (CSI) elements. CAMEL Subscription Information is provided by the HPLMN operator by administrative means.

The following CSIs may be administered per subscriber:

D-CSI *Dialled Services CAMEL Subscription Information* (D-CSI) is transferred to the VPLMN (at location update), IPLMN (for an incoming call in GMSC) or the IM CN subsystem. D-CSI contains trigger information which is required to invoke a CAMEL service logic for subscribers dialled services. See section 5.3.2 and section A.2.2 for the usage of D-CSI.

GPRS-CSI *GPRS CAMEL Subscription Information (GPRS-CSI)* is transferred to the VPLMN. GPRS-CSI contains trigger information which is required to invoke a CAMEL Service Logic for GPRS Sessions and PDP Contexts.
See section 10 for the usage of GPRS-CSI.

M-CSI *Mobility Management CAMEL Subscription Information (M-CSI)* is transferred to the VPLMN. M-CSI is used to notify the CSE about Mobility Management events for the CS subscriber.
See section 12.1 for the usage of M-CSI.

MG-CSI *Mobility Management for GPRS CAMEL Subscription Information (MG-CSI)* is transferred to the VPLMN. MG-CSI is used to notify the CSE about Mobility Management events for the GPRS subscriber.
See section 12.1 for the usage of MG-CSI.

MO-SMS-CSI *Originating Short Message Service CAMEL Subscription Information (MO-SMS-CSI)* is transferred to the VPLMN. MO-SMS-CSI contains trigger information that is required to invoke a CAMEL Service Logic for Mobile Originating Short Message submissions.
See section 9 for the usage of MO-SMS-CSI.

MT-SMS-CSI Terminating *Short Message Service CAMEL Subscription Information (MT-SMS-CSI)* is transferred to the VPLMN. MT-SMS-CSI contains trigger information that is required to invoke a CAMEL Service Logic for Mobile Terminating Short Message delivery.
See section 9 for the usage of MT-SMS-CSI.

O-CSI *Originating CAMEL Subscription Information (O-CSI)* is transferred to the VPLMN (at location update),to the IPLMN (for an incoming call in the GMSC) and to the IM CN subsystem. O-CSI contains trigger information that is required to invoke a CAMEL Service Logic for Mobile Originating calls (in the VMSC) and Mobile Forwarding calls (in the VMSC and the GMSC).
See sections 5 and A for the usage of O-CSI.

SS-CSI *Supplementary Service Invocation Notification CAMEL Subscription Information (SS-CSI)* is transferred to the VPLMN. SS-CSI is used to notify the CSE about the invocation of certain Supplementary Services.
See section 12.3 for the usage of SS-CSI.

T-CSI *Terminating CAMEL Subscription Information (T-CSI)* is transferred to the IPLMN for an incoming call in the GMSC. T-CSI contains trigger information which is required to invoke a CAMEL Service Logic for Mobile Terminating calls in the GMSC.
See section 6 for the usage of T-CSI.

TIF-CSI *Translation information Flag CAMEL Subscription Information (TIF-CSI)* is transferred to the VPLMN. TIF-CSI is used in the HLR for registering short Forwarded-to-Numbers (FTNs). When TIF-CSI is present, the subscriber is allowed to register short FTNs.
When the subscriber invokes Call Deflection, TIF-CSI in the VPLMN allows the subscriber to deflect to short Deflected-to-Numbers.
See section 18.3 for the usage of TIF-CSI.

U-CSI *USSD CAMEL Subscription Information (U-CSI)* is held in the HLR; it is not sent to any other node. U-CSI contains trigger information which is used to invoke a USSD application in the CSE for the served subscriber.
See section 14.3 for the usage of U-CSI.

UG-CSI *USSD General CAMEL Subscription Information (UG-CSI)* is held in the HLR; it is not sent to any other node. UG-CSI contains trigger information which is used to invoke a USSD application in the CSE for all subscribers.
See section 14.3 for the usage of UG-CSI.

VT-CSI VMSC *Terminating CAMEL Subscription Information (VT-CSI)* is transferred to the VPLMN at location update and to the IM CN subsystem. VT-CSI contains trigger information which is required

to invoke a CAMEL Service Logic for Mobile Terminating calls in the VMSC.
See sections 6 and A for the usage of VT-CSI.

Refer to 3GPP TS 23.078 for detailed descriptions of the various types of CAMEL Subscription Information.

The CSI may include the Default Call Handling, Default GPRS Handling or Default SMS Handling.

The Default Call Handling indicates whether the call shall be released or continued if the contact with the CSE is not confirmed or is interrupted.

Network -based services may be provided by the serving PLMN operator. The provisioning mechanism is out of the scope of this specification.

Trunk originated services may be provided by the PLMN operator. The provisioning mechanism is out of the scope of this specification.

4.2 General Procedures

Each process is made up of a series of telecommunication events, some of which are service events. At a service event, the IPLMN or VPLMN may:

- Suspend the handling of the telecommunication service and make contact with a CSE to ask for instructions, or
- Send a notification to the CSE and continue the handling of the telecommunication service, or
- Continue the handling of the telecommunication service without sending a notification to the CSE.

When a service event is reported to the CSE, the IPLMN or VPLMN shall send to the CSE the information listed in this specification. All information sent to the CSE relates to the served CAMEL subscriber unless otherwise stated. The initial service events, which can initiate contact with the CSE, are defined in the CAMEL Subscription Information. The CSE identity which corresponds to each initial service event is also defined in the CAMEL Subscription Information.

The serving network shall accept the instruction from the CSE and continue call processing with the received information.

The CAMEL feature is applicable in a PLMN when the CAMEL subscription information is handled properly and when the communication to the CSE is compliant with the CAMEL protocol [8].

The CAMEL network capabilities are used at a PLMN when the CAMEL feature is applicable and:

- The CSI is received from the HPLMN; or
- The CSE requests congestion control in the VPLMN or IPLMN.

In addition dialled network-based services may be applicable in a PLMN if so administered.

In addition trunk originated based services may be applicable in a PLMN if so administered. See section X ~~X Procedures for serving network trunk originated services~~

The CSE shall be capable of responding to the CAMEL request with instructions on how to resume the suspended process. In the case of subscriber-based services the CSE shall be able to instruct the IPLMN or VPLMN to:

- Activate subsequent service events to be reported to the CSE. These events shall remain active only for the lifetime of the telecommunication service;
- Alter information relating to the suspended process;
- Alter information relating to the parties involved in the process;
- Indicate which of the possible parts of the process should occur next (e.g. terminate the call);
- Perform charging activities;
- Order in band user interaction.

If a control relationship exists between the CSE and the IPLMN/VPLMN of the served subscriber, then at any time during the call the CSE can instruct the IPLMN/VPLMN of the served subscriber to perform one or more of the following Call Party Handling operations:

- Create additional parties in the call (additional parties shall be created in a held state);
- Release an individual call party-;
- Release all parties in the call.

If a control relationship exists between the CSE and the IPLMN/VPLMN of the served subscriber, then at any time during the alerting and active phases of a call leg, the CSE can instruct the IPLMN/VPLMN of the served subscriber to perform the following Call Party Handling operation:

- Connect an individual call party to the group of call parties, within the same call (the call party shall be in a held state immediately before this operation).

If a control relationship exists between the CSE and the IPLMN/VPLMN of the served subscriber, then at any time during the active phase of a call leg, the CSE can instruct the IPLMN/VPLMN of the served subscriber to perform the following Call Party Handling operation:

- Place an individual call party on hold (the call party shall not be in a held state immediately before this operation).

NOTE: Call Party Handling operations are not applicable to a call leg or group of legs which are involved in user interaction (Play Announcement or Prompt and Collect User Information)

It shall be possible for the CSE to initiate a new call to the HPLMN/VPLMN of a subscriber at any time.

For subscribed dialled services it shall be possible for the CSE to instruct the serving PLMN to perform either or both of the following actions:

- Perform charging activities;
- Order in band user interaction.

After the CSE has issued either or both of the preceding instructions, it shall issue exactly one of the following instructions to the serving PLMN:

- Continue the processing of the call, or
- Continue the processing of the call with modified information, or
- Connect the calling party to a specified called party, or
- Release the call.

After one of the above instructions, the relation between the serving network and the CSE shall be released. Any other behaviour may cause misoperation of CAMEL based services.

Serving network-based service numbers may be treated after the behaviour described above. These services are outside the scope of the CAMEL specification.

Serving network based service numbers may be provided at the discretion of the network operator but these are outside the scope of this specification.

CAMEL features shall form an integral part of the following processes:

- Mobile Originated call (MO call);
- Mobile Terminated call (MT call) in GMSC;
- Mobile Terminated call (MT call) in VMSC;
- Mobile Forwarded call (MF call) - early call forwarding; early forwarded calls are treated as MO calls;
- Mobile Forwarded call (MF call) - late call forwarding; late forwarded calls are treated as MO calls;

- Trunk Originated call (TO call) – call received on an incoming trunk at the MSC;
- Mobile Originated IP Multimedia Session in Serving CSCF;
- Mobile Terminated IP Multimedia Session in Serving CSCF;
- Supplementary service invocation;
- USSD user interaction. The service codes for CAMEL services can be allocated per subscriber or globally for all subscribers of the HPLMN;
- Mobile Originated Short Message (MO SM) service; via both the MSC and the SGSN;
- Mobile Terminating Short Message (MT SM) service; via both the MSC and the SGSN;
- General Packet Radio Service (GPRS);
- Mobility Management events;
- Interrogation and control of Subscription Data.

The CSE shall be able to interrogate the HPLMN for information about the location and status of a particular subscriber at any time.

4.3 Applicability of CAMEL Procedures

CAMEL procedures are applicable to all circuit switched Basic Services without distinction (except Emergency calls).

CAMEL procedures are applicable to GPRS sessions and PDP contexts.

CAMEL procedures are applicable to the Mobile Originating/ Terminating Short Message Service through both circuit switched and packet switched serving network entities.

CAMEL procedures are applicable to IP multimedia sessions (except Emergency Calls) to support legacy services.

CAMEL shall support IPMM sessions which are based on the same charging paradigms as CS/PS calls. This applies most probably to VoIP and Video over IP. New charging paradigms - and this includes especially the flexible content-based charging - are to be supported by the new charging functions defined for the IM domain.

CAMEL procedures are applicable to IP multimedia sessions addressed by either E.164 numbers or SIP URLs.

NEXT MODIFIED SECTION

8 Procedures for Call Party Handling

CPH procedures only apply to speech telephony (TS11) as defined in TS 22.003 [10].

CPH procedures apply to MO, MF, MT, VT, TO and CSE initiated calls. If the served subscriber is involved in a CPH configuration controlled by her CSE, then any further MO or MT call setup request involving the served subscriber shall be handled by a separate relationship with the served subscriber's CSE. This new relationship may lead to the creation of a further CPH configuration for the served subscriber. The service logic for one CSE relationship is not necessarily aware of what is happening in another CSE relationship involving the same served subscriber.

It is not required to transfer a leg or a group of legs between separate CPH configurations.

Where service logic involves Call Party Handling procedures, the Service Interaction Indicators Two parameter should be used to manage interactions with Supplementary Services (CF, CD and MPTY for each call leg and ECT and HOLD for the served subscriber).

The CSE shall be able to add parties to, or remove parties from, the group. Each party in this group can communicate with all other parties in the group. The IPLMN/VPLMN shall support at least 6 parties (of which one may be a Specialised Resource Function) in a group.

If a control relationship exists, the CSE may order in-band user interaction with any held call party at any point during the active phase of the call leg.

Charging activities shall be possible during a CPH configuration as indicated in clause 15.

NEXT MODIFIED SECTION

14 Subscriber interactions with the CSE

14.1 Announcement and tones insertion

As a part of the following procedures, it shall be possible for the CSE to order the playing of announcements or tones to the calling subscriber:

- The call set-up request procedure;
- The unsuccessful call establishment procedure;
- The call disconnection procedure;
- The incoming call request procedure;
- The called party alert reporting procedure.

In the active phase of the call leg and in the mid-call procedure it shall be possible for the CSE to play tones and/or announcements to any held party or the group as specified in clauses 5, 6, ~~and~~ 8 and X ~~X Procedures for serving network trunk originated services~~. It shall be possible to play tones efficiently using local tone generators.

The HPLMN operator is responsible for the administration of announcements. If there is an appropriate bilateral agreement the VPLMN operator may also administer announcements.

14.2 Voice prompting and information collection

As a part of the call set-up request procedure, unsuccessful call establishment procedure, call disconnection procedure and incoming call request procedure it shall be possible for the CSE to order voice prompting and information collection to the calling subscriber. It shall not be possible to collect information from the user as part of the originating CAMEL handling for a forwarded call.

In the active phase of the call leg and in the mid-call procedure it shall be possible for the CSE to order voice prompting and information collection towards any held party as specified in clauses 5, 6, ~~and~~ 8 and X ~~X Procedures for serving network trunk originated services~~.

14.3 Subscriber interaction by using USSD

It shall be possible for the CSE to initiate the sending of a USSD message to the served subscriber at any time. It shall be possible for the CSE to receive a served subscriber initiated USSD message at any time (see TS 22.030 [3] and TS 22.090 [4]).

15 Charging Activities

The following general principles are valid for CAMEL based charging aspects:

- Calls may be divided into call periods for the purpose of controlling the call duration;
- The management and the control of tariff switches is under the responsibility of the HPLMN. There may be a tariff switch for the CSE control of e-values and separate tariff switches for the control of call duration (which apply per call leg).The time at which these tariff switches apply may differ or the CSE control of e-values and for the control of the call duration.;
- The tariff switch time is indicated to the network in the form of a time relative to the reception of the instruction.
- In a CPH configuration, the following procedures shall apply per call party:
  - Inclusion in charging records of information received from the CSE (subclause 15.2);
  - Support of additional charging information to the CSE (subclause 15.3);
  - CSE control of call duration (subclause 15.4).
- The e values sent by the CSE are reported only to the served subscriber and only if this subscriber is connected to the CPH configuration (subclause 15.1).

15.1 CSE controlled e-values

If the subscriber is provisioned with a CAMEL based service and a contact exists between the VPLMN and the CSE, the CSE shall be able to send e-values for the Advice of Charge supplementary service. Those e-values represent the charge applicable to the CPH configuration.

For the purpose of charge indication on the MS even when one (or more) tariff switch occurs during the call, the CSE may send several sets of e-values to the VPLMN, which will transmit them in sequence to the Mobile Station of the served subscriber.

Before the call is answered, the CSE may send either one set or two sets of e-values:

- If one set is sent, then the set of e-values is applicable from the beginning of the call, that is from the time any call leg is answered;
- If two sets are sent, then:
  - A tariff switch time after which the second set becomes valid must also be sent;
  - If any call leg is answered before the tariff switch time expires, then the first set of e-values is applicable from the beginning of the call and the second set of e-values is stored for future use;
  - If any call leg is answered after the tariff switch time expires, then the first set of e-values is discarded and the second set of e-values is applicable from the beginning of the call.

During the call, the CSE may send a new set of e-values either to be transmitted directly to the mobile station or to be stored until the next tariff switch is reached. The tariff switch time is sent together with the new set of e-values.

When the tariff switch time is reached, the stored set of e-values is sent immediately to the mobile station.

CSE controlled e-values are not applicable to Trunk Originated CAMEL services.

15.2 Inclusion in charging records of information received from the CSE

The CSE shall be able at one or several active service events to download free-format charging information to be transparently output to the call record available at the IPLMN/VPLMN depending on the call scenario. The CSE can download free-format charging information for each call leg separately.

15.3 Support of additional charging information to the CSE

It shall be possible for the CSE to request from the VPLMN/IPLMN a call information report to be delivered at the termination of the call leg. The report shall contain call duration and release cause. The CSE can request a report for each call leg of the CPH configuration.

15.4 CSE control of call duration

The purpose of this procedure is to allow the CSE to monitor and influence the call duration for each call leg independently of the other call legs in the CPH configuration. A change in the CPH configuration may result in a revision of the maximum call period duration for the altered call leg.

If the subscriber is provisioned with a CAMEL based service and a contact between the IPLMN/VPLMN and the CSE exists, the CSE shall be able to instruct the IPLMN/VPLMN, at the beginning of the call or during the monitoring of the call, to act as described below:

a) Receive a maximum call period duration from the CSE for a call leg;

b) Receive a switch time after which the next tariff switch applies for a call leg;

c) Receive sets of e-values for the served subscriber (for the purpose of AoC controlled by the CSE).

The following combinations of the instructions are allowed:

- (a) or (a and b) or (a and c) or (b and c) or (a and b and c) or (c).

In the above combinations it shall be possible for the CSE to instruct multiple values of (a) and/or (b).In case (a) the CSE shall be able to instruct the IPLMN/VPLMN how to proceed when the maximum call period duration has expired, i.e. release the call leg or allow the call leg to continue. In both cases, a charging report shall be sent to the CSE. The CSE shall also be able to instruct the IPLMN/VPLMN to play a tone before the maximum call period duration is expired.

The CSE shall be able to instruct the IPLMN/VPLMN to begin playing of an audible tone to the served subscriber at anytime before the maximum call period time is expired.

The tone to be played shall consist of up to three audible bursts. A burst shall consist of a single tone, or a sequence of two tones, or a sequence of three tones. A normal speech path connecting all parties in the call shall be established between bursts. The CSE shall be able to instruct the IPLMN/VPLMN:

- The time before the maximum call period time expires when tone playing shall start;
- The number of bursts to be played (1, 2 or 3);
- The time interval between bursts (maximum 120 seconds);
- The number of tones in each burst (1, 2 or 3);
- The duration of the tone in a burst;
- The pause between the tone in a burst.

When the instruction sent by the CSE is received at the IPLMN/VPLMN as a result of the call set up request procedure before the call is established, the IPLMN/VPLMN shall immediately set the reference point for the next tariff switch, if available.

When a call leg is answered, the IPLMN/VPLMN shall:

- Start the timer for the first call period for that leg;
- Send e-values, if available:
    - If one set of e-parameters were received from the CSE, then the set of e-values is applicable from the beginning of the call, that is from the time the first call leg is answered;
    - If two sets of e-parameters were received from the CSE, then:

- A tariff switch time when the second set becomes valid must be also sent;
- The first set of e-values is applicable from the beginning of the call (that is from the time the first call leg is answered) except in the case where the tariff switch time occurs before the first call leg is answered, in which case the second set of e-values is applicable at the beginning of the call.

When the reference point for the tariff switch is reached, the stored set of e-values is sent immediately to the mobile station, if available.

When the end of a call period is reached, the IPLMN/VPLMN shall report to the CSE:

- If no tariff switch has occurred since the call leg was answered or since the call was modified by a CPH procedure:
  - Report the elapsed time since the call leg was answered or modified by a CPH procedure to the CSE;
- If a tariff switch has occurred since the call leg was answered or since the call was modified by a CPH procedure:
  - Report the elapsed time since the last tariff switch has applied;
  - Report the elapsed time from when the call leg was answered or modified by a CPH procedure or from when the previous tariff switch occurred to the time when the most recent tariff switch occurred.

When the IPLMN/VPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN to act as described below:

- Perform charging activities;
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported (Call disconnection);
  - The party in the call for which the event shall be detected and reported (calling or called party).
  - The type of monitoring (control or notification).

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Release the call;
- Continue the call processing.

At the end of a call period and after the relevant information was sent to the CSE, the IPLMN/VPLMN may receive instructions applicable to for the next call period for the call leg:

- The timing of the new call period shall start as soon as the previous call period is ended;
- The timing since the call leg was answered or the last tariff switch occurred shall keep on running;
- If the instruction contains an indication for a new tariff switch during the call period, the IPLMN/VPLMN shall set the reference point for the next tariff switch and store the new set of e-values, if available.

When the reference point for the tariff switch is reached, the stored set of e-values (if available) is sent immediately to the mobile station.

When the call leg is released, the IPLMN/VPLMN shall report to the CSE:

- If no tariff switch has occurred since the call leg was answered or since the call was modified by a CPH procedure:
  - The elapsed time since the call leg was answered or modifiied by a CPH procedure.
- If a tariff switch has occurred since the call leg was answered or since the call was modified by a CPH procedure:

- The elapsed time since the last tariff switch occurred,
- The elapsed time from when the call leg was answered or modified by a CPH procedure or from when the previous tariff switch occurred to the time when the most recent tariff switch occurred.

In addition, the report to the CSE shall always contain an indication of whether the call leg is active or held.

The following figure explains the division of a call leg into separate call periods and shows which information is sent and when from the IPLMN/VPLMN to the CSE.

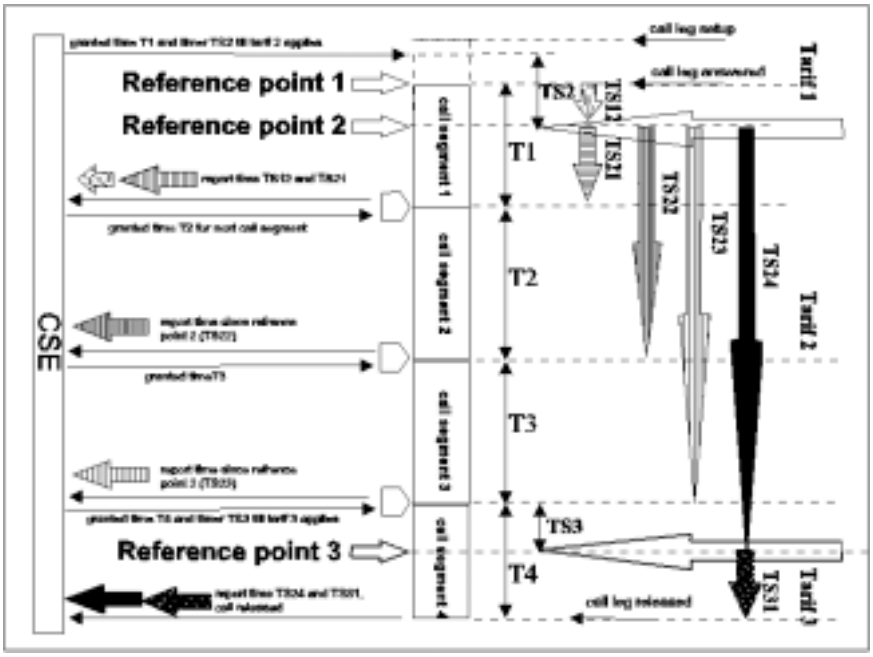

Figure 1: CSE control of call duration

Reference Point 1: when the call leg is answered, tariff 1 applies
Reference Point 2: the point in time when tariff 2 applies
Reference Point 3: the point in time when tariff 3 applies
A call period is a certain time part of an ongoing call. The duration of a call period is limited by the granted time from the CSE.
Timers indicating the maximum duration (or granted time) for the call periods are called Tx (x is the number of the call period).
Timers indicating the duration until the next tariff applies are called TSx (x is the number of the tariff).
Timers indicating the elapsed time in a certain tariff are called TSxy (x is the number of the tariff and y is the elapsed time since the previous reference point).
When a call period is ended, the elapsed time in each tariff is reported to the CSE.

At the end of the call period any timer indicating the duration until the next tariff switch for this call leg is discarded.

If the report is not confirmed by the CSE within a specified time, the IPLMN/VPLMN shall release the call leg.

The procedure may be repeated sequentially, i.e. when a report is sent to the CSE, the CSE may instruct the IPLMN/VPLMN to monitor the call for a further period.

NEW SECTION

X Procedures for ~~serving network~~ trunk originated services

Trunk originated services may be provided by a PLMN operator.

When overlap signaling procedures are used a TO call setup request may only contain a partial digit string. The PLMN may:

- wait to collect all digits before following the procedures below (Note: this may result in a delay in call set-up); or
- collect a minimum number of digits before following the procedures below (Note: it may be necessary to avoid the use of CSE-initiated user interaction while additional digits are still being received); or
- support CSE requests for additional digit collection, as defined below (Note: it may be necessary to avoid the use of CSE-initiated user interaction while additional digits are collected)

x.1 Initial service events

It shall be possible to specify which of the following initial service events shall initiate contact with the CSE:

- Collection of dialled digits;
- Analysis of dialled digits.

The definition of which of the above initial service events shall initiate contact with the CSE is part of the Trunk Originated CAMEL Service Information provisioned by the PLMN operator. The provisioning mechanism is out of the scope of this specification.

Analysis of dialled digits can open a new dialogue regardless of whether a relationship exists.

x.2 Criteria for contact with the CSE

It shall be possible for the ~~V~~PLMN to specify criteria which must be satisfied before the CSE is contacted.

X.2.1 Criteria applicable at call setup

X.2.1.1 Criteria applicable at call setup when dialled digits have been collected

Criteria may be defined for the case when~~re~~ collection of dialled digits has been performed. Criteria may be based on the contents and/-or length of the dialled number, basic service, call type or other information at the discretion of the network operator, however this is outside the scope of this specification.

X.2.1.2 Criterion applicable at call setup when dialled digits are analysed

Criteria on the contents of the called number may be defined for dialled services -at the discretion of the network operator, however this is outside the scope of this specification.

x.3 Call set-up request procedure

x.3.1 Procedure when dialled digits have been collected

The purpose of this procedure is to detect a call set-up request at the point where digits have been collected but not analysed, and to allow the CSE to modify the handling of the call set-up request.

If no control relationship for the ~~given~~ call exists and:

- The incoming trunk is provisioned with a Trunk originated CAMEL service; and
- The call set-up request occurs; and

- The criteria are satisfied.

Then the PLMN shall suspend call processing, make contact with the CSE and await further instructions.

When the PLMN has made contact with the CSE, and the CSE has determined that additional ~~called party~~ digits are required in order to determine the appropriate handling for the call, the CSE shall instruct the PLMN to act as described below.

- Activate subsequent control service event for the call. The CSE shall request that the following subsequent service event shall be detected and reported:
  - Collection of dialled digits. The CSE may specify the number of digits to be collected
- The type of monitoring (control or notification)

Once the CSE has concluded issuing the above instruction, it shall issue the following instruction:

- Collect information (i.e. CSE request for the collection of additional digits).

hen the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below.

- Perform charging activities;
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - Called party alert;
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
    - Mid call event (DTMF or out of band information). The CSE shall specify the digit string(s) or the out of band information for which the instruction is valid. Out-band information may be detected during alerting phase of the call;
    - Change of basic service.
  - The party in the call for which the event shall be detected and reported (calling or called party);
  - The type of monitoring (control or notification).
- Order in-band user interaction;

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Bar the call (i.e. release the call prior to connection);
- Continue the call processing;
- Continue the call processing with modified information;
- Continue the handling of the calling party without routeing the call to the destination.

If a relationship for the ~~given~~ call already exists and the CSE has activated this subsequent service event for this call and the collection of dialled digits event occurs the PLMN shall:

- Suspend call processing, notify the CSE and await further instructions.

The following information shall be provided to the CSE:

- Event met;
- The ~~called party number~~dialled digits;
- Type of monitoring.

When the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below.

- Perform charging activities;
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - Called party alert;
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
    - Mid call event (DTMF or out of band information). The CSE shall specify the digit string(s) or the out of band information for which the instruction is valid. Out-band information may be detected during alerting phase of the call;
    - Change of basic service.
  - The party in the call for which the event shall be detected and reported (calling or called party);
  - The type of monitoring (control or notification).
- Order in-band user interaction;

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Bar the call (i.e. release the call prior to connection);
- Continue the call processing;
- Continue the call processing with modified information;
- Continue the handling of the calling party without routeing the call to the destination.

x.3.2 Procedure for trunk originated dialled services

The purpose of this procedure is to detect a call set-up request at the point where the called party number has been compared with the stored Trunk Originated service numbers, and allow the CSE to modify the handling of the call set-up request. Triggering of this procedure shall happen immediately after the procedure when dialled digits have been collected. If any other CAMEL dialogue has changed the called party number then the modified called party number is used for the conditional triggering check.

x.3.2.1 Initiation of contact with the CSE

If:

- The incoming trunk is provisioned with Trunk originated CAMEL service information; and

- The call set-up request occurs; and
- The criteria are satisfied.

Then the PLMN shall suspend call processing, make contact with the CSE and await further instructions.

x.3.2.2 Further processing of the call

If a relationship exists with a CSE, then when the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below:

- Perform charging activities The CSE is only allowed to include free format data in Call Data Records (refer to sect. 15.2, 'Inclusion in charging records of information received from the CSE');
- Order in-band user interaction. (Interaction between the service triggered from previous triggering may be needed to avoid duplicated guidance etc.).

Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Release the call;
- Continue the call processing;
- Continue the call processing with modified information;

If no relationship exists with a CSE for the call, then when the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below:

- Collect additional digits (when overlap signalling occurs and the PLMN supports CSE requests for additional digits) as defined in subclause X.3.1;
- Perform charging activities;
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - Called party alert;
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
    - Mid call event (DTMF or out of band information). The CSE shall specify the digit string(s) or the out of band information for which the instruction is valid. Out-band information may be detected during alerting phase of the call;
    - Change of basic service.
  - The party in the call for which the event shall be detected and reported (calling or called party);
  - The type of monitoring (control or notification).
- Order in-band user interaction.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Allow the call processing to continue unchanged;
- Allow the call processing with modified information;

- Continue the handling of the calling party without routeing the call to the destination;
- Release the call.

x.4 Calling party abandon

The purpose of this procedure is to manage an ~~outgoing~~ call set-up at the time it is terminated by the calling party before the call is established.

If the CSE has activated this subsequent service event for this call in notify mode and the calling party abandon event occurs the PLMN shall:

- Notify the CSE and continue.

The following information shall be provided to the CSE:

- Event met;
- Type of monitoring;

~~The CSE shall send the following instruction:~~

- ~~Continue the call processing.~~

If the CSE has activated this subsequent service event for this call in request mode and the calling party abandon event occurs the PLMN shall suspend call processing, make contact with the CSE and await further instructions.

When the PLMN has made contact with the CSE in request mode, the CSE shall be able to instruct the PLMN to act as described below.

- Perform charging activities.

There shall be no restriction regarding the number of times the above instruction can be repeated. Once the CSE has concluded issuing the above instruction, it shall issue the following instruction:

- Continue the call processing.

x.5 Unsuccessful call establishment

If a relationship for the ~~given~~ call already exists and the CSE has activated this subsequent service event for this call and the unsuccessful call establishment event occurs the PLMN shall:

- Suspend call processing, notify the CSE and await further instructions, or
- Notify the CSE and continue call processing.

In both cases above the following information shall be provided to the CSE:

- Event met;
- Type of monitoring;
- Cause for unsuccessful call establishment:
  - Not reachable;
  - Busy;
  - No answer;
  - Route select failure.

When the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below:

- Perform charging activities;

- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - Called party alert;
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
    - Mid call event (DTMF or out of band information). The CSE shall specify the digit string(s) or the out of band information for which the instruction is valid. Out-band information may be detected during alerting phase of the call. The detection of the mid call event shall be limited to the VPLMN;
    - Change of basic service.
  - The party in the call for which the event shall be detected and reported (calling or called party);
  - The type of monitoring (control or notification).
- Order in-band user interaction;

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Release the call;
- Continue the call processing;
- Continue the call processing with modified information.

x.6 Called party connection procedure

The purpose of this procedure is to manage a~~n outgoing~~ call set-up at the time when the called party answers and the call is successfully established.

If the CSE has activated this subsequent service event for this call and the called party connection event occurs the PLMN shall:

- Suspend call processing, notify the CSE and await further instructions, or
- Notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported (only called party applicable);
- The charge indicator which will be used in the Call Data Record if available;
- Type of monitoring.

When the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below.

- Perform charging activities;
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:

- Call disconnection;
- Mid call event (DTMF or out of band information). The CSE shall specify the digit string(s) or the out of band information for which the instruction is valid. The out-band information may be detected during alerting phase. The detection of the mid call event shall be limited to VPLMN only);
- Change of basic service.

- The party in the call for which the event shall be detected and reported (calling or called party);
- The type of monitoring (control or notification).

- Order in-band user interaction.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Release the call;
- Continue the call processing.

x.7 Mid call procedure

See subclause 5.7, Consider “VPLMN” of 5.7 as “PLMN” and “served subscriber” of 5.7 as “trunk originated call”.

x.8 Call disconnection procedure

The purpose of this procedure is to manage the actions on disconnection of an established call. This procedure is applicable to any party in the call.

If the CSE has activated this subsequent service event for this call and the call disconnection event occurs the PLMN shall:

- Suspend call processing, notify the CSE and await further instructions, or
- Notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported;
- Type of monitoring;
- Disconnection reason.

When the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below:

- Perform charging activities
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - Called party alert;
    - Called party connection;
    - Call disconnection;
    - Calling party abandon;
    - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;

- Mid call event (DTMF or out of band information). The CSE shall specify the digit string(s) or the out of band information for which the instruction is valid;
- Change of basic service.

- The party in the call for which the event shall be detected and reported (calling or called party);
- The type of monitoring (control or notification).

- Order in-band user interaction;

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue one and only one of the following instructions:

- Continue the call processing, i.e. release the call;
- Continue the call processing with modified information.

x.9 CSE initiated call release procedure

Following the CAMEL processing of the ~~C~~call set-up request procedure it shall be possible for the CSE to initiate a call release at any moment of the call.

To use this procedure:

- The ~~originating~~ PLMN shall have reported an initial service event to the CSE and be waiting for instructions from the CSE, or
- The CSE shall be waiting for the report of any subsequent service event (with ”Type of monitoring” set to control).

x.10 Called party alert reporting procedure

The purpose of this procedure is to manage a~~n outgoing~~ call set-up at the time when the called party is alerted.

If the CSE has activated this service event for this call and the called party alert event occurs the PLMN shall:

- Suspend call processing, notify the CSE and await further instructions, or
- Notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- The party in the call for which the event is reported (only called party applicable);
- Type of monitoring.

When the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below:

- Perform charging activities;
- Activate subsequent control service events for the call. The CSE shall have the possibility to send the following information:
  - The service event which shall be detected and reported:
    - Calling party abandon;
    - Unsuccessful call establishment. In the case of no answer the CSE may provide a no answer timer;
    - Call disconnection;

- Mid call event (DTMF);
- Called party connection
- Change of basic service.

- The party in the call for which the event shall be detected and reported;
- The type of monitoring (control or notification).

- Order in-band user interaction with the calling party.

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated. Once the CSE has concluded issuing the above instructions, it shall issue the following instruction:

- Continue the call processing.

x.11 Change of basic service

When the CSE has instructed the PLMN to arm the change of basic service event, the PLMN shall report the event when the basic service changes. It shall be possible for the CSE to instruct the PLMN to re-arm the change of basic service event when it is encountered. The CSE may arm this event in the various phases of the call (as specified in this specification)– however the PLMN reports the basic service changes in the active phase of the call only.

If the CSE has activated this service event for this~~e trunk originated~~ call and a change of basic service event occurs the PLMN shall:

- Notify the CSE and continue call processing.

The following information shall be provided to the CSE:

- Event met;
- Type of monitoring;
- Event specific data;
  - Basic service:
- Charge result if charging supervision is provided:

When the PLMN has made contact with the CSE, the CSE shall be able to instruct the PLMN to act as described below:

- Perform charging activities;
- Activate other control service events for the call. The CSE shall have the possibility to send the following information:
  - The service event which shall be detected and reported:
    - Change of basic service.
  - The party in the call for which the event shall be detected and reported;
  - The type of monitoring (notification).

There shall be no restriction regarding the order of the above instructions or the number of times each of the above instructions can be repeated.

END OF MODIFICATIONS