SMG1 (99)342

Agenda Item:9.3.20

Technical Specification Group Services and System Aspects

Meeting #5, Kyongju, Korea, 11-13 October 1999

TSGS#5(99)443

Source:	**TSG S1**			
Title:	**Collection of CRs to 02.78 and 22.078 on CAMEL**			
Document for:	**Approval**			
Agenda Item:	**5.1.3**			

1-99-268	22.078	001	R99	Camel control of packet switched MO SMS
1-99-272	22.078	002	R99	Removal Initial Service Events in case of Unsuccessful MO call establishment
1-99-290	22.078	003	R99	Work Item Camel Phase 3 CSE Related overload control
1-99-333	22.078	004	R99	Referenced by LS in 344
1-99-338	22.078	005	R99	Inclusion of Service Key in Mobility Management event notifications + editorial modifications
1-99-339	22.078	006	R99	Clarification the behaviour when network provided dialled services are used.
1-99-341	22.078	007	R99	279 > 341
1-99-342	22.078	008	R99	284 > 342
1-99-345	22.078	009	R99	336 > 345 CR Rev Jeremy
S1-99590	22.078	010	R99	Editorial update of references for GSM/3GPP use
S1-99594	22.078	011	R99	Proposed CR for CAMEL3 interworking with GPRS; Change of position
S1-99596	22.078	012	R99	Proposed CR for CAMEL3 DTMF Mid-Call corrections and clarifications
S1-99597	22.078	013	R99	Proposed CR for CAMEL3 clean-up of IPLMN and VPLMN references
S1-99598	22.078	014	R99	CR Defining successful SM submission to SMSC as EDP
S1-99673	22.078	015	R99	CR SAT/MExE interworking
S1-99675	22.078	016	R99	Correction Annex A.2; Information sent by the CSE
S1-99677	22.078	017	R99	Correction on GPRS handling (Version 2)
S1-99681	22.078	018	R99	Short Message Submission Handling (version2)
S1-99684	22.078	019	R99	CR O-CSI Information
S1-99686	22.078	020	R99	CR Free formatted information
S1-99689	22.078	021	R99	Defining Successful SM submission and Unsuccessful SM submission as EDP-N and EDP-R.
S1-99770	22.078	022	R99	Proposed CR for CAMEL3 corrections to new Trigger Detection Points (TDP) (2nd version)
S1-99771	22.078	023	R99	CR CSI description
S1-99773	22.078	024	R99	Proposed CR for CAMEL3 corrections and clarifications to dialled services (subscribed & serving network)
S1-99774	22.078	025	R99	Charging clarifications for MO-SMS (New Version)
S1-99775	22.078	026	R99	Proposed CR for CAMEL3 Call Forwarding and new TDP interworking (2nd Version)
S1-99776	22.078	027	R99	CLI modification
S1-99777	22.078	028	R99	CCBS Service interaction
S1-99772	22.078	029	R99	CR Network based CAMEL service invocation
1-99-335	02.78	A041	R97	Introduction of a "Health Warning" on type of numbers sent by the mobile other than "unknown" or "international" CR

ETSI STC SMG1 meeting # 64 (99/2)

SMG1 (99)342

Quebec City 5th - 6th July 1999 — rendered: Quebec City 5th - 6th July 1999

Agenda Item:9.3.20

ETSI STC SMG1 meeting # 64 (99/2)

SMG1 (99)268

Quebec City 5th - 6th July 1999

Agenda Item: 9.3.7

CHANGE REQUEST No :	**001**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078 Version: 3.0.0

Submitted to SMG #30 for approval without presentation ("non-strategic")
list SMG plenary meeting no. here ↑ for information with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Ericsson **Date:** 24 June 1999

Subject: CAMEL control of packet switched MO SMS

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

Reason for change:

The reason for this CR is twofold:

- The CAMEL Phase 3, stage 1 specification shall reflect explicitly that CAMEL control of MO SMS is applicable to both packet switched MO SMS and circuit switched MO SMS.

- When an MO SMS submission request results in CAMEL Service Logic invocation, then the VPLMN shall report time and time zone.
  Currently, the CAMEL Phase 3, stage 1 specification specifies that only the time zone shall be reported.

Clauses affected: 1, 4.3, 9.1

Other specs Affected:				
	Other releases of same spec		→ List of CRs:	
	Other core specifications		→ List of CRs:	
	MS test specifications / TBRs		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

> *** *First modified section* ***

1   Scope

This standard specifies the stage 1 description for 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.

CAMEL is developed in phases. The following phases exist:

-    CAMEL phase 1. This is the default phase in this specification. Text that are only applicable to phase 1 are characterised with the formal designator - $(CAMEL1$)

-    CAMEL phase 2. It is characterised where necessary with the formal designation - $(CAMEL2$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL2$)

-    CAMEL phase 3. It is characterised where necessary with the formal designation - $(CAMEL3$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL3$)

The CAMEL feature is applicable

-    to mobile originated and mobile terminated call related activities;

-    as a CAMEL phase 2 function, to supplementary service invocations - $(CAMEL2$);

-    as a CAMEL Phase 3 function, to SMS MO, to GPRS sessions, to the control of HLR subscriber data, to control different call party connections, to the control of network signalling load and, - $(CAMEL3$);

-    as a CAMEL Phase 3 function, to CSE created calls - $(CAMEL3$).

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 enhance the capabilities of phase 1 and are included in this standard. Following capabilities are added:

-    Additional event detection points.

-    Interaction between a user and 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 GSM supplementary services (ECT, CD, MPTY).

-    For easy 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. Following capabilities are added :

-    Capabilities for enhanced handling of call party connections, together with the ability to handle more than 2 parties in a call

-    Support of facilities to avoid overload situations.

-    Capabilities to support Dialled Services.

-    Capabilities to handle mobility events, such as (Not-)reachability and roaming.

- Control of GPRS sessions.

- Control of circuit switched mobile originating SMS and packet switched mobile originating SMS.

- Support of SoLSA. Support of Localised Service Area interworking is an optional feature. The support for interworking with mobile terminating calls is a requirement, however the specific details of how this will be realised is for further study - $(CAMEL3$)

Detailed information can be found in the respective sections.

*** Next modified section ***

4.3 Applicability of CAMEL procedures to Basic Services

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

CAMEL procedures are applicable to GPRS sessions $(CAMEL3$).

CAMEL procedures are applicable to circuit switched Mobile Originating Short Message Service and to packet switched Mobile Originating Short Message Service $(CAMEL3$).

*** Next modified section ***

9.1 Short message submission request procedure

The purpose of this procedure is to detect a SMS set-up request and allow the CSE to modify the handling of the SMS set-up request.

The SMS set-up request may be circuit switched based or packet switched based.

If (according to the CSI) :

- the subscriber is provisioned with a CAMEL based SMS originating service; and

- the SMS set-up request occurs;

Then the VPLMN shall suspend SMS processing, make contact with the CSE and await further instructions.

For mobile originated SMS the following information shall be provided to the CSE if available:

- Event met;

- IMSI;

- Identity of the originator of the SM (SIM, ME, User);

- SMSC address;

- Calling Party's Number;

- Service Key;

- Location information of the calling subscriber;

- time and time zone;

- Called Party Number.

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

- perform charging activities (inclusion in charging record of information received from the CSE);

- activate other control service events for the SM submission. The CSE shall have the possibility to send the following information:

  - The service event which shall be detected and reported:

    - Unsuccessful SM submission.

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

- bar the SM submission;

- allow the submission to continue unchanged;

- allow the SMS processing with modified information. The CSE shall have the possibility to send the following information:

  - Called Party Number;

  - Calling Party's Number;

  - SMSC address.

In the case where the SM submission is barred, the served subscriber shall be informed.

3GPP TSG-S1
Quebec – Canada
05 - 09 July 1999

3GPP Tdoc S1-99 272
Agenda: 9.3.11

CHANGE REQUEST No :	**002**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG #30   for approval ☐   without presentation ("non-strategic") ☐
list SMG plenary meeting no. here ↑   for information ☐   with presentation ("strategic") ☐

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Siemens AG   **Date:** 29 June 1999

Subject: Remove Initial Service Events in case of Unsuccessful MO call establishment

Category:

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

(one category and one release only shall be marked with an X)

Reason for change:

The present CR removes initial service events in case of CAMEL triggering for MO calls.

It seems to be not reasonable to apply CAMEL originating services on conditions of the called subscriber. This is rather unpractical and not under the control of the calling subscriber!

To whom should a subscriber divert his call attempt when the called subscriber is not reachable, does not answer or is busy?

Clauses affected: 5.1, 5.5

Other specs affected:

Other releases of same spec	☐	→ List of CRs:	
Other core specifications	☐	→ List of CRs:	
MS test specifications / TBRs	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

5.1   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;

-   Detection of unsuccessful call establishment.
    Unsuccessful call establishment may be caused by:

    ~~called subscriber busy;~~

    ~~called subscriber not reachable;~~

    ~~no answer from called subscriber;~~

    -   route select failure.

The definition of which of the above initial service events shall initiate contact with the CSE is part of the subscriber's CAMEL subscription information. Only one of the above initial service event is indicated for each OSS.

5.5   Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an outgoing call set-up at the time when the call establishment is unsuccessful.

If no control relationship for the given call exists and

- the unsuccessful call establishment procedure is defined as initial service event (according to the CSI); and

- the call attempt is unsuccessful; and

- the triggering criteria are satisfied .

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

If a relationship for the given call already exists and the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the VPLMN 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

If the unsuccessful call procedure is armed as a initial service event, the information listed in table: A-1 (Unsuccessful call establishment) shall be provided to the CSE additionally if available. - $(CAMEL3$)

When the 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 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:

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

        - Mid call event (DTMF) $(CAMEL3$);

    - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- 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. The CSE shall have the possibility to send the following information listed in table: A-2 (Unsuccessful call establishment (MO)).

- release call

ETSI STC SMG1 meeting # 64 (99/2)

Quebec City 5th - 6th July 1999

SMG1 (99)342

Agenda Item:9.3.20

ETSI STC SMG1 meeting # 64 (99/2)

Quebec City 5th - 6th July 1999

SMG1 (99)290

Agenda Item:9.3.23

CHANGE REQUEST No :	**003**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG   **#30**   for approval [ ]   without presentation ("non-strategic") [ ]
list SMG plenary meeting no. here ↑   for information [ ]   with presentation ("strategic") [ ]

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Siemens AG   **Date:**   29 June 1999

Subject: CSE related overload control

Category:
F   Correction
A   Corresponds to a correction in an earlier release
(one category   B   Addition of feature
and one release   C   Functional modification of feature   [**X**]
only shall be   D   Editorial modification
marked with an X)

Release: Phase 2 [ ]
Release 96 [ ]
Release 97 [ ]
Release 98 [ ]
Release 99 [**X**]
UMTS [ ]

Reason for change:
The present CR re-designs the method when a CSE is in overload condition.

The current text does not consider the security issue from a V/IPLMN point of view. The present text requires the network to accept any overload indication from any CSE. This might be used in maliciously. On the other hand it does impose unnecessary additional load on the overloaded CSE to react on interrogation requests.

A simpler but also efficient method is proposed to treat security aspects as well as load aspects.

For information: the default call handling method was introduced in CAMEL phase 2 and is described in 03.78 version 6.3.0 but only refereed for the first time in the stage 1 description.

Clauses affected: 4.1, 17

Other specs affected:
Other releases of same spec [ ]   → List of CRs:
Other core specifications [ ]   → List of CRs:
MS test specifications / TBRs [ ]   → List of CRs:
BSS test specifications [ ]   → List of CRs:
O&M specifications [ ]   → List of CRs:

Other comments:

4.1   Provision of CAMEL

The CAMEL Subscription Information (CSI) is provided by the HPLMN operator by administrative means.

The CSI may include the Translation Information Flag (TIF-CSI). If present for a subscriber the network will apply special handling of the call forwarding supplementary service. For details refer to section 12.3 $(CAMEL2$).

The CSI may inculde the Default Call Handling Indicator.

The Default Call Handling indicates whether the call shall be released or continued in case of the contact to the CSE is not confirmed or interrupted.

The Network CAMEL Service Information (N-CSI) for network-based services is provided by the serving PLMN operator. The provisioning mechanism is out of the scope of this specification. -$(CAMEL3$).

17   CSE related congestion control

It shall be possible for the CSE to request that either all or some CAMEL interrogations be dropped by the VPLMN and/or IPLMN. It shall be possible to specify that these interrogations be dropped if:

   -   the Global Title of the CSE that the congestion control request was received from matches the Global Title of the CSE that is indicated in the O-CSI or T-CSI, or

   -   the Global Title of the CSE that the congestion control request was received from matches the Global Title of the CSE that is indicated in the O-CSI or T-CSI and the service key indicated in the congestion control request from the CSE matches the service key indicated in the O-CSI or T-CSI.

It shall be possible for the CSE to drop or reject either all or some CAMEL interrogations from a V/IPLMN.

In the case where the contact from the V/IPLMN is not confirmed by the CSE, the V/IPLMN shall proceed in accordance to the Default Call Handling.

3GPP TSG-S1
Quebec – Canada
05 - 09 July 1999

3GPP Tdoc 1-(99)333
Agenda: 9.3.12

CHANGE REQUEST No :	**004**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*	

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG **#30**
list SMG plenary meeting no. here ↑

for approval ☐   without presentation ("non-strategic") ☐
for information ☐   with presentation ("strategic") ☐

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Siemens AG   **Date:** 29 June 1999

Subject: Clarify the serving network behaviour when instructions from the CSE are received.

Category:

(one category and one release only shall be marked with an X)

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

Reason for change:

The present CR clarifies the proceeding at the serving network in case of instructions from the CSE with modified information.

The reason why the CSE is allowed to modify certain information, was to modify the call processing in accordance to the result of the subscribed CAMEL service. It shall not be the decision of the serving network to select which of the modified information are taken to continue. From the operating CAMEL service point of view, it must be guaranteed to proceed at the serving network as it is requested by the service. Any other behaviour of the serving network could cause severe problems and may lead to incorrect operation of the service.

Clauses affected: 4.2

Other specs affected:

Other releases of same spec	☐	→ List of CRs:
Other core specifications	☐	→ List of CRs:
MS test specifications / TBRs	☐	→ List of CRs:
BSS test specifications	☐	→ List of CRs:
O&M specifications	☐	→ List of CRs:

Other comments:

4.2   General Procedures

Each GSM 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE is 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; or - $(CAMEL3$);

-    the CSE creates a call - $(CAMEL3$).

In addition dialled services may be applicable in a PLMN if the N-CSI is active in the PLMN. -$(CAMEL3$)

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

-    Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

-    Order in band user interaction -$(CAMEL2$);

-     Create additional parties in the call - $(CAMEL3$);

-     Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

-    Continue the processing of the call, or;

-    Connect the calling party to a specified called party;

After one of the above instructions, the relation between the serving network and the CSE shall be released.

It should be possible in the case of serving network-based services to:

-    Continue the processing of the call, or;

-    Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- MT call;

- MO call (forwarded calls are treated as MO calls);

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service $(CAMEL3$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

ETSI STC SMG1 meeting # 64 (99/2)

Quebec City 5th - 6th July 1999

ETSI STC SMG1 meeting # 64 (99/2)

SMG1 (99)342

Agenda Item:9.3.20

SMG1 (99) 338

Quebec City 5th - 6th July 1999

CHANGE REQUEST No :	**005**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG #30   for approval ☐   without presentation ("non-strategic") ☐
list SMG plenary meeting no. here ↑   for information ☐   with presentation ("strategic") ☐

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Ericsson   **Date:**   5 July 1999

Subject: Inclusion of Service Key in Mobility Management event notifications + editorial modifications

Category:

(one category and one release only shall be marked with an X)

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

Reason for change:

The present CR adds a Service Key to the Mobility Management event notifications.

A Service Key in the Mobility Management event notifications is a useful mechanism to select a Service Logic in the CSE.

The Service Key is administered in the HPLMN and is subscriber specific.

The Service Key forms part of the CAMEL Subscription Information and is transported between HPLMN and VPLMN in the same was as, for example, the Service Key in O-CSI and T-CSI.

Furthermore, some minor editorial improvements have been made to section 4.2.

Clauses affected: 4.2, 12.1

Other specs affected:

Other releases of same spec	☐	→ List of CRs:	
Other core specifications	☐	→ List of CRs:	
MS test specifications / TBRs	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

> *** *First modified section* ***

4.2   General Procedures

Each GSM 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE is defined in the CAMEL Subscription 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; or - $(CAMEL3$);

-    the CSE creates a call - $(CAMEL3$).

In addition dialled services may be applicable in a PLMN if the N-CSI is active in the PLMN. -$(CAMEL3$)

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

-    Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

-    Order in band user interaction -$(CAMEL2$);

-    Create additional parties in the call - $(CAMEL3$);

-    Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

-    Continue the processing of the call, or;

-    Connect the calling party to a specified called party;

After one of the above instructions, the relation between the serving network and the CSE shall be released.

It should be possible in the case of serving network-based services to:

-    Continue the processing of the call, or;

-    Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- ~~MT call;~~

- ~~MO call (forwarded calls are treated as MO calls);~~

- Mobile Originated call (MO call);

- Mobile Terminated call in GMSC (MT call);

- Mobile Terminated call in VMSC (MT call); $(CAMEL3$);

- 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;

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service $(CAMEL3$).

- Mobility Management events $(CAMEL3$)

~~As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.~~
The CSE shall be able to interrogate the HPLMN for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

+---+
| *** Next modified section *** |
+---+

12   Notifications of non-traffic events to the CSE $(CAMEL3$)

12.1   Mobility management $(CAMEL3$)

It shall be possible to mark for a subscriber that a notification shall be sent to the CSE when the VPLMN has completed the processing of any of the following mobility events:

- Location update of MS. ~~Following criteria shall be able to defined~~It shall be possible to define the following criteria:

    - Location update ~~in~~to a different VLR service area;

    - Location update ~~in~~within the same VLR service area;

- MS-initiated detach (MS switched off);

- Network initiated detach (periodic location update of MS failed);

- Attach of MS (MS switched on, successful location update after network initiated detach);

The notification shall contain the following information if available:

- Event met;

- Service Key;

- IMSI;

- Basic MSISDN;

- Location information;

- LSA identity;

- CAMEL phase supported at the VPLMN.

3GPP TSG-S1   **3GPP Tdoc 1-99 339**

Quebec – Canada

Agenda: 9.3.10

05 - 09 July 1999

CHANGE REQUEST No :	**006**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG   **#30**   for approval [ ]   without presentation ("non-strategic") [ ]
list SMG plenary meeting no. here ↑   for information [ ]   with presentation ("strategic") [ ]

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Siemens AG   **Date:**   29 June 1999

Subject: Clarification the behaviour when network provided dialled services are used.

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

Reason for change: The present CR clarifies the behaviour when subscribed CAMEL services and dialled network based services has to interwork for one subscriber in the same call.

The conclusion of the CR is to put no restriction on network based services but to trigger them after subscribed and subscribed dialled services.

Clauses affected: 4

Other specs affected: Other releases of same spec   [ ]   → List of CRs:
                             Other core specifications   [ ]   → List of CRs:
                             MS test specifications / TBRs   [ ]   → List of CRs:
                             BSS test specifications   [ ]   → List of CRs:
                             O&M specifications   [ ]   → List of CRs:

Other comments:

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

The CAMEL Subscription Information (CSI) is provided by the HPLMN operator by administrative means.

The CSI may include the Translation Information Flag (TIF-CSI). If present for a subscriber the network will apply special handling of the call forwarding supplementary service. For details refer to section 12.3 $(CAMEL2$).

~~The Network CAMEL Service Information (N-CSI) for~~N-network-based services <u>may be</u> ~~is~~ provided by the serving PLMN operator. The provisioning mechanism is out of the scope of this specification. -$(CAMEL3$).

4.2   General Procedures

Each GSM 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE is defined in the CAMEL Subscription 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; or - $(CAMEL3$);

-    the CSE creates a call - $(CAMEL3$).

In addition dialled <u>network based</u> services may be applicable in a PLMN if <u>so administered.</u> ~~the N-CSI is active in the PLMN.~~ $(CAMEL3$)

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

-    Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

-    Order in band user interaction -$(CAMEL2$);

-    Create additional parties in the call - $(CAMEL3$);

-    Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

- Continue the processing of the call, or;

- Connect the calling party to a specified called party;

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.

It should be possible in the case of sServing network-based services numbers may be treated after the above described behaviour. These services are outside the scope of the CAMEL specification.
Serving network based service numbers may be provided on the discretion of the network operator but they are outside this specification.

to:

    Continue the processing of the call, or;

    Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- MT call;

- MO call (forwarded calls are treated as MO calls);

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service $(CAMEL3$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

4.3   Applicability of CAMEL to Basic Services

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

CAMEL procedures are applicable to GPRS session $(CAMEL3$).

3GPP TSG-S1   **3GPP Tdoc S1-99 341**
Quebec – Canada   **Agenda: 9.3.18**
05 - 09 July 1999

CHANGE REQUEST No :	**007**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.78   Version: 3.0.0

Submitted to SMG   #30   for approval   ☐   without presentation ("non-strategic")   ☐
list SMG plenary meeting no. here ↑   for information   ☐   with presentation ("strategic")   ☐

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Siemens AG   **Date:**   29 June 1999

Subject: Correct the unsuccessful call establishment procedure for MT calls

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

Reason for change: The present CR corrects the unsuccessful call establishment procedure for MT calls. It is agreed and described in chapter 6 to allow this procedure to be armed as a initial event procedure. This was not reflected in the relevant chapter of the current version.

Clauses affected: 6.5

Other specs affected:			
Other releases of same spec	☐	→ List of CRs:	
Other core specifications	☐	→ List of CRs:	
MS test specifications / TBRs	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

6.5   Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an incoming call set-up at the time when the call establishment is unsuccessful.

If no control relationship for the given call exists and

- the unsuccessful call establishment procedure is defined as initial service event (according to the CSI); and

- the call attempt is unsuccessful; and

- the triggering criteria are satisfied ,

then the VPLMN shall suspend call processing, make contact with the CSE and await further instructions.

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

~~If the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the IPLMN shall:~~

- suspend call processing, notify the CSE and await further instructions, or

- notify the CSE and continue call processing.

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

- Event met;

- Type of monitoring;

- Cause for unsuccessful call establishment:

  - not reachable;

  - busy;

  - no answer.

If the unsuccessful call establishment procedure is armed as a initial service event, information listed in table: A.1 (Unsuccessful call establishment (M~~O~~T)) shall be provided to the CSE additionally if ~~availabel~~available. - $(CAMEL3$).

When the IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN 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:

    - Called party connection;

    - Call disconnection;

    - Calling party abandon;

    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

- 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- 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. The CSE shall have the possibility to send the information listed in table: A-2 (Unsuccessful call establishment (MT)).

- release call

S1-99342

3G CHANGE REQUEST

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

22.078 CR	**008**	Current Version:	3.0.0

3G specification number ↑   *↑ CR number as allocated by 3G support team*

For submision to TSG _____   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   ☐   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

---

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source:	Nokia		**Date:**	9.6.1999

Subject: GSM 02.78 Clean-up of CAMEL phase information

3G Work item: CAMEL phase 3

Category: F   Correction   **X**

    A   Corresponds to a correction in a 2G specification   ☐

(only one category   B   Addition of feature   ☐

shall be marked   C   Functional modification of feature   ☐

with an X)   D   Editorial modification   ☐

Reason for change: GSM 02.78 has some mistakes regarding to brackets indication the appropriate CAMEL phases.

1. Chapter 3: NAEA was already in CAMEL2 (R97).

2. Chapter 5.1: DP2 was the only initial service event in CAMEL2.

3. Chapter 6.1: DP12 (Authorisation attempt) was the only initial service event in CAMEL2.

4.   Chapter 8: CSE created calls were introduced in CAMEL3.

5.   Chapter 13: It is confusing to have CAMEL2 header under CAMEL3 header. Since chapter 13.2 has CAMEL3 brackets, chapter 13 does not need to have them.

6.   Chapter 17: CSE congestion control is introduced in CAMEL3.

7.   Chapter 18.7: CAMEL phase 2 supports MO AoC only. CAMEL phase 3 supports AoC also in MT calls.

8.   Appendix A.1: CAMEL2 had NAEA interworking. In CAMEL3 all the cases should have the same information flow for North American markets. ChargeNumber and OLI are not sent to the CSE in any case.

9.   Appendix A2: Same as above.

Clauses affected:

Other specs	Other 3G core specifications		→ List of CRs:	
affected:	Other 2G core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

3   Definitions and abbreviations

Operator Specific Service (OSS): Any service offered to a GSM / UMTS mobile user that is not standardised by the GSM specifications.

Interrogating PLMN (IPLMN): This is the PLMN that performs the interrogation of the HPLMN for information on the treatment of a terminating call.

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

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

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

Network CAMEL Service Information (N-CSI): The N-CSI identifies services offered on a per-network basis by the serving PLMN operator for all subscribers. - $(CAMEL3$)

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

CAMEL Subscription Information (CSI): The 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.

These OSS may include both services provisioned for individual subscribers and services provisioned equally for all subscribers of an HPLMN. - $(CAMEL3$)

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

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

-   **Geographical information** (longitude and latitude)when Cell ID or Location Area Code is known) this 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 resolution and accuracy of the indicated location information may also be provided.

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

-   **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 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**: any MS that is not CAMEL-busy or network determined not reachable.

GPRS attach: Is the period where the GPRS subscriber is registered to the GPRS data network. - $(CAMEL3$)

GPRS session: A session starts when a GPRS subscriber activates the start to send or receive data packets and ends when the subscriber deactivates the PDP transport. - $(CAMEL3$)

PDP: Packet Data Protocol (as defined in GSM 02.60 [6]) - $(CAMEL3$)

Route select failure: - $(CAMEL3$)

[test to be added]

Carrier Identification Code: Identifies uniquely the Carrier (NAEA). - $(CAMEL23$)

Carrier Selection Information: Is an indication whether the subscriber selected a carrier, or the carrier is predefined for the subscriber (NAEA). - $(CAMEL23$)

Originating Line Identification: Identifies uniquely the subscriber to be charged for the usage of the carrier (NAEA). - $(CAMEL23$)

Charge Number: Identifies uniquely the organisation to be charged for the usage of the carrier (NAEA). - $(CAMEL23$)

NAEA: North American Equal Access (NAEA). - $(CAMEL23$)

Subscribed Dialled Services: Identifies a set of maximum of ten service numbers. These service numbers are globally available to all HPLMN subscribers. No subscription is needed to access the service numbers within the HPLMN. Each service number is chosen on the HPLMN operators discretion. In the case of international roaming, the set of service numbers forms a part of the subscribers profile. - $(CAMEL3$)

5.1 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;

$(begin$(CAMEL3$)

-   Analysis of dialled digits;

-   Detection of unsuccessful call establishment.
    Unsuccessful call establishment may be caused by:

    -   called subscriber busy;

    -   called subscriber not reachable;

    -   no answer from called subscriber;

    -   route select failure.

$(end$(CAMEL3$)

The definition of which of the above initial service events shall initiate contact with the CSE is part of the subscriber's CAMEL subscription information. Only one of the above initial service event is indicated for each OSS.

6.1 Initial service events

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

- Authorisation attempt

$(begin$(CAMEL3$)

- Detection of unsuccessful call establishment.

    Unsuccessful call establishment may be caused by:

    - called subscriber busy;

    - called subscriber not reachable;

    - no answer from called subscriber.

$(end$(CAMEL3$)

8 CSE initiated call set up $(CAMEL3$)

The purpose of this procedure is to allow the CSE to initiate a call. The CSE shall send a request to initiate a call attempt by creating a connection from the IPLMN/VPLMN to an initial call party. The CSE shall always arm all events pertaining to unsuccessful call connection and to answer, and then the CSE shall request continueation of the call process before any other activities are performed on the initial call party.

The information that it shall be possible to receive in the initiate call attempt request is listed in table: A-2 (CSE initiated call set up).

Upon receipt of an answer or unsuccessful call establishment event then the event is reported to the CSE.

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.

Processing then continues as defined in the section for dialled services.

[Editors Note: The reference has to been checked after inclusion of respective chapter]

13   CSE control of GSM subscription data $(CAMEL3$)

13.1   Any time interrogation $(CAMEL2)$

It shall be possible for the CSE (as part of an OSS, including special handling of mobile terminating calls) to interrogate the HLR for information about a particular subscriber, for which it is entitled to do so (e.g. the subscriber belongs to the same HPLMN as the CSE).

This may be information from the list below:

-    subscriber status;

-    location information;

-    Call forwarding SS data $(CAMEL3$);

-    Call barring SS data $(CAMEL3$);

-    Operator determined barring data $(CAMEL3$);

-    CAMEL subscription information $(CAMEL3$);

-    CAMEL phase supported at the VPLMN $(CAMEL3$).

The HPLMN shall have the possibility to reject any interrogation from any CSE.

13.2   Any time modification $(CAMEL3$)

It shall be possible for the CSE to modify user data for a particular subscriber, for which it is entitled to do so (e.g. the subscriber belongs to the same HPLMN as the CSE).

This shall be data from the list below:

-    Call forwarding supplementary service data;

-    Call barring supplementary service data;

-    CAMEL subscription information.

The HPLMN shall have the possibility to reject any modification from any CSE.

17   CSE related congestion control $(CAMEL3$)

It shall be possible for the CSE to request that either all or some CAMEL interrogations be dropped by the VPLMN and/or IPLMN. It shall be possible to specify that these interrogations be dropped if:

-   the Global Title of the CSE that the congestion control request was received from matches the Global Title of the CSE that is indicated in the O-CSI or T-CSI, or

-   the Global Title of the CSE that the congestion control request was received from matches the Global Title of the CSE that is indicated in the O-CSI or T-CSI and the service key indicated in the congestion control request from the CSE matches the service key indicated in the O-CSI or T-CSI.

18.7 Advice of Charge (AoC)

Advice of Charge is not guaranteed to operate correctly for calls subject to CAMEL phase 1 based services. It is recommended that subscribers are not provisioned with Advice of Charge and any CAMEL based service for which there is an adverse interaction.

$(begin$(CAMEL2$)

If CAMEL phase 2 is supported and the phase 2 charging function "CSE controlled e-values" is used, the VPLMN shall use the received e-values from the CSE for the purpose of the AoC supplementary service. Once the VPLMN has received e-values from the CSE, only CSE provided e-values are applicable for this call. The e-values shall only be sent by the VPLMN to the MS if the served subscriber is provided with the AoC supplementary service according to GSM 02.86. CAMEL phase 2 allows CSE to modify e-values in MO calls only.

$(end$(CAMEL2$)

$(begin$(CAMEL3$)

If CAMEL phase 2 or 3 is supported and the phase 2 or 3 charging function "CSE controlled e-values" is used, the VPLMN/IPLMN shall use the received e-values from the CSE for the purpose of the AoC supplementary service. Once the VPLMN/IPLMN has received e-values from the CSE, only CSE provided e-values are applicable for this call. The e-values shall only be sent by the VPLMN/IPLMN to the MS if the served subscriber is provided with the AoC supplementary service according to GSM 02.86. CAMEL phase 3 allows CSE to modify e-values in MO and MT calls.

$(end$(CAMEL3$)

A.1 Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various events. The numbers are reflecting the applicable Camel phase (!, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Call set-up request procedure 3	Call set-up request procedure 4	Unsuccessful call establishment	Incoming call request procedure	Procedures for serving network dialled services	Procedures for serving network dialled services 2
Event met	1	1	3	3	3	1	3	3
IMSI	1	1	3	3	3	1	3	3
Calling Party's Number	1	1	3	3	3	1	3	3
Calling Party's Category	1	1	3	3	-	1	3	3
Additional Calling Party Number	-	1	-	3	-	1	-	3
Called Party BCD Number	1	-	3	-	3	-	3	-
Called Party Number	-	1	-	3	-	1	-	3
Original Called Party Number	-	1	-	3	-	1	-	3
Redirecting (Party) Number ????	-	1	-	3	-	1	-	3
Redirection Information	-	1	-	3	-	1	-	3
Service Key	1	1	3	3	3	1	3	3
ISDN Bearer Capability	1	1	3	3	3	1	3	3
High Layer Compatibility	1	1	3	3	3	1	3	3
Basic Service Code	1	1	3	3	3	1	3	3
Call Identification Information	1	1	3	3	3	-	?	?
Location Information of the Calling Subscriber	1	-	3	-	3	-	3	-
Location Number of the Calling Subscriber	-	-	-	-	-	1	-	-
Location information of the called subscriber	-	-	-	-	-	1	-	-
Subscriber State of the called subscriber	-	-	-	-	-	1	-	-
Time and Time Zone Information - $(CAMEL2$)	2	2	3	3	3	2	?	?
Optimal Routing Indication - $(CAMEL3$)	-	-	?	?	-	-	3	3
Calling Party LSA (if available) $(CAMEL3$)	3	-	3	-	-	-	3	-
IMEI -$(CAMEL3$)	3	-	3	-	3	-	?	-
Terminal characteristics and capabilities (see MExE, 02.57) - $(CAMEL3$)	3	-	3	-	3	-	?	-
MExE classmark (see MExE, 02.57) -$(CAMEL3$)	3	-	3	-	3	-	?	-
NAEA Carrier Identification Code (CIC) -$(CAMEL3$)	2~~3~~	2~~3~~	3	3	3	2~~3~~	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) -$(CAMEL3$)	2~~3~~	2~~3~~	3	3	3	2~~3~~	3	3
~~NAEA Originating Line Identification (OLI) - $(CAMEL3$)~~	-	~~3~~	-	~~3~~	-	-	-	~~3~~
~~NAEA Charge Number (CN) - $(CAMEL3$)~~	-	~~3~~	-	~~3~~	-	-	-	~~3~~

Table A-1: Information transferred towards the CSE.

A.2 Information sent by the CSE

The following table shows the information that is sent by the CSE on various events. The numbers are reflecting the applicable Camel phase (1, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Unsuccessful call establishment (MO)	Call disconnection procedure (MO)	Creation of called parties	Incoming call request procedure	Unsuccessful call establishment (MT)	Call disconnection procedure (MT)	Procedures for serving network dialled services	CSE initiated call set up
Called Party Number	1	3	2	2	3	1	2	2	3	3
Calling Party Number	-	-	-	-	3	-	2	-	-	3
Calling Party's Category	1	3	2	2	3	1	2	2	3	3
Calling IMSI	-	-	-	-	-	-	-	-	-	3
ISUP CUG information	-	-	-	-	3	-	-	-	-	-
Additional Calling Party's Number	1	3	2	2	3	1	2	2	3	3
Original Called Party Number	1	3	2	2	-	1	2	2	3	-
Redirection Party Number	1	3	2	2	3	1	2	2	3	-
Redirection Information	1	3	2	2	3	1	2	2	3	-
Alerting Pattern	-	-	-	-	3	2	-	-	-	3
ISDN Access related Information	-	-	-	-	3	-	-	-	-	3
ISDN Bearer Capability	-	-	-	-	3	-	-	-	-	3
High Layer Compatibility	-	-	-	-	-	-	-	-	-	-
Basic Service Code	-	-	-	-	-	-	-	-	-	-
Called Party to be Created	-	-	-	-	3	-	-	-	-	3
New Call Segment	-	-	-	-	3	-	-	-	-	3
In Service Compatibility Response	-	-	-	-	3	-	-	-	-	3
Service Interaction Indicators Two	-	-	-	-	3	-	-	-	-	3
Location Number	-	-	-	-	3	-	-	-	-	3
Optimal Routing Indication $(CAMEL3$)	3	3	3	2	3	3	3	3	-	3
NAEA Carrier Identification Code (CIC) - $(CAMEL3$)	2-	23	23	23	3	23	23	23	3-	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) - $(CAMEL3$)	2-	23	23	23	3	23	23	23	3-	3
NAEA Originating Line Identification (OLI) - $(CAMEL3$)	2-	23	23	23	3	23	23	23	3-	3
NAEA Charge Number (CN) - $(CAMEL3$)	2-	2-	2-	2-	3-	23	23	23	3-	3-
CSE Address	-	-	-	-	-	-	-	-	-	3

Table A-2: Information sent by the CSE.

CHANGE REQUEST No :	**009**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG **#30**   for approval **X**   without presentation ("non-strategic") **X**
list SMG plenary meeting no. here ↑   for information   with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Camel Ad-Hoc   **Date:**   5 July 1999

Subject: Clarification on the type of number used by mobile stations.

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

Reason for change: Camel Phase 3 applications shall be able to set trigger criteria on any type of number (TON) received from the mobile station. (Alignment to Stage 2 & 3).

Clauses affected: 5.2

Other specs affected: Other releases of same spec   → List of CRs:
    Other core specifications   → List of CRs:
    MS test specifications / TBRs   → List of CRs:
    BSS test specifications   → List of CRs:
    O&M specifications   → List of CRs:

Other comments:

3   Definitions and abbreviations

Operator Specific Service (OSS): Any service offered to a GSM / UMTS mobile user that is not standardised by the GSM specifications.

Interrogating PLMN (IPLMN): This is the PLMN that performs the interrogation of the HPLMN for information on the treatment of a terminating call.

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

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

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

Network CAMEL Service Information (N-CSI): The N-CSI identifies services offered on a per-network basis by the serving PLMN operator for all subscribers. - $(CAMEL3$)

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

CAMEL Subscription Information (CSI): The 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.

These OSS may include both services provisioned for individual subscribers and services provisioned equally for all subscribers of an HPLMN. - $(CAMEL3$)

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

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

-   **Geographical information** (longitude and latitude)when Cell ID or Location Area Code is known) this 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 resolution and accuracy of the indicated location information may also be provided.

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

-   **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 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**: any MS that is not CAMEL-busy or network determined not reachable.

GPRS attach: Is the period where the GPRS subscriber is registered to the GPRS data network. - $(CAMEL3$)

GPRS session: A session starts when a GPRS subscriber activates the start to send or receive data packets and ends when the subscriber deactivates the PDP transport. - $(CAMEL3$)

PDP: Packet Data Protocol (as defined in GSM 02.60 [6]) - $(CAMEL3$)

Route select failure: - $(CAMEL3$)

[test to be added]

Carrier Identification Code: Identifies uniquely the Carrier (NAEA). - $(CAMEL3$)

Carrier Selection Information: Is an indication whether the subscriber selected a carrier, or the carrier is predefined for the subscriber (NAEA). - $(CAMEL3$)

Originating Line Identification: Identifies uniquely the subscriber to be charged for the usage of the carrier (NAEA). - $(CAMEL3$)

Charge Number: Identifies uniquely the organisation to be charged for the usage of the carrier (NAEA). - $(CAMEL3$)

NAEA: North American Equal Access (NAEA). - $(CAMEL3$)

Subscribed Dialled Services: Identifies a set of maximum of ten service numbers. These service numbers are globally available to all HPLMN subscribers. No subscription is needed to access the service numbers within the HPLMN. Each service number is chosen on the HPLMN operators discretion. In the case of international roaming, the set of service numbers forms a part of the subscribers profile. - $(CAMEL3$)

Type of number (TON): Identifies the format a number.

5.2 Criteria for contact with the CSE $(CAMEL2$)

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

The following criteria may be defined:

5.2.1 CSI criteria applicable at call setup

5.2.1.1 CSI criteria applicable at call setup when dialled digits have been collected $(CAMEL2$)

CSI criteria may be defined for a subscriber for the case where collection of dialled digits has been performed $(CAMEL3$).

- Criteria on the dialled number; these consist of:

    - The contents of the dialled number (a list of up to 10 dialled number strings may be defined in the criteria. Each dialled number string may be ~~in~~ of ~~"unknown" or "international"~~any type of number (TON) format supported by the access protocol.);

    - The length of the dialled number (a list of up to three lengths may be defined.).

- The criteria on the dialled number may be collectively defined to be either "enabling" triggering criteria or "inhibiting" triggering criteria (see below). The HPLMN may also choose not to define any criteria on the dialled number.

- A criterion on the basic service: this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

- A criterion on the type of call: this consists of defining whether or not the call must be a forwarded call.

    A call is treated as forwarded in this respect when either a GSM forwarding supplementary service applies or when the call is forwarded as a result of a terminating CAMEL based service. The HPLMN may also choose not to define any criterion on the type of call.

If the criteria on dialled number are "enabling" then the dialled number criteria are satisfied if:

- the dialled number matches a dialled number string defined in the criteria; or

- the length of the dialled number matches a dialled number length defined in the criteria.

If the criteria on the dialled number are "inhibiting" then the dialled number criteria are satisfied if:

- the dialled number does not match any of the dialled number strings defined in the critera; and

- the length of the dialled number is not the same as any dialled number length defined in the criteria.

In these tests the dialled number matches one of the dialled number strings if:

- the two numbers are ~~in the same format~~of the same type of number (TON) ~~(unknown or international)~~; and

- the dialled number is at least as long as the dialled number string in the criteria; and

- all the digits in the dialled number string in the criteria match the leading digits of the dialled number.

If no criterion on the dialled number is specified then the dialled number criteria are satisfied.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

The criterion on the type of call is satisfied if the type of the call is the same as the type defined in the criterion or if no call type criterion is specified.

The criteria on the call setup event procedure are satisfied if:

- the criteria on the dialled number are satisfied; and

- the criterion on the basic service is satisfied; and

- the criterion on the type of call is satisfied.

5.2.1.2 CSI criterion applicable at call setup for subscribed dialled services $(CAMEL3S)

A CSI criterion on the contents of the called number shall be defined for subscribed dialled services. A list of up to 10 called number strings may be defined in the criterion. ~~Each called number string may be in "unknown" or "international" format.~~ Each entry in the called number list has associated with it a CSE identity and a service key which defines the service to be triggered if the criterion is satisfied.

The total number of entries in the dialled number list (5.1.A.1) and the called number list (5.1.A.2) shall not exceed 10.

The called number criterion is satisfied if the called number matches a called number string defined in the criterion.

In this test the called number matches one of the called number strings if:

- the two numbers are ~~in the same format~~of the same type of number (TON) ~~(unknown or international)~~; and

- the called number is at least as long as the called number string in the criteria; and

- all the digits in the called number string in the criteria match the leading digits of the called number.

3G CHANGE REQUEST

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

22.078	CR	**010**	Current Version:	3.0.0

3G specification number ↑

↑ *CR number as allocated by 3G support team*

For submision to TSG SA#5   for approval **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network ☐

(at least one should be marked with an X)

Source:	SA WG1	**Date:**	

Subject:	Editorial update of references for GSM/3GPP use.

3G Work item:	3TS/SA-0122060

Category:	F	Correction	☐
	A	Corresponds to a correction in a 2G specification	☐
(only one category	B	Addition of feature	☐
shall be marked	C	Functional modification of feature	☐
with an X)	D	Editorial modification	**X**

Reason for change:	The transfer of GSM specifications for 3GPP requires the update of references to the transferred 3GPP equivalents. Text referring to the GSM system needs to be changed to refer to both the GSM and 3G systems.

Clauses affected: All clauses with GSM references

Other specs affected:

Other 3G core specifications	☐	→ List of CRs:	
Other 2G core specifications	☐	→ List of CRs:	
MS test specifications	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

help.doc

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

1   Scope

This standard specifies the stage 1 description for 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.

CAMEL is developed in phases. The following phases exist:

-   CAMEL phase 1. This is the default phase in this specification. Text that are only applicable to phase 1 are characterised with the formal designator - $(CAMEL1$)

-   CAMEL phase 2. It is characterised where necessary with the formal designation - $(CAMEL2$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL2$)

-   CAMEL phase 3. It is characterised where necessary with the formal designation - $(CAMEL3$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL3$)

The CAMEL feature is applicable

-   to mobile originated and mobile terminated call related activities;

-   as a CAMEL phase 2 function, to supplementary service invocations - $(CAMEL2$);

-   as a CAMEL Phase 3 function, to SMS MO, to GPRS sessions, to the control of HLR subscriber data, to control different call party connections, to the control of network signalling load and, - $(CAMEL3$);

-   as a CAMEL Phase 3 function, to CSE created calls - $(CAMEL3$).

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 enhance the capabilities of phase 1 and are included in this standard. Following capabilities are added:

-   Additional event detection points.

-   Interaction between a user and 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 ~~GSM~~ supplementary services (e.g ECT, CD, MPTY).

-   For easy postprocessing, charging information from a serving node can be integrated in normal call records.

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

-   Capabilities for enhanced handling of call party connections, together with the ability to handle more than 2 parties in a call

-   Support of facilities to avoid overload situations.

-   Capabilities to support Dialled Services.

-   Capabilities to handle mobility events, such as (Not-)reachability and roaming.

-   Control of GPRS sessions.

-   Control of mobile originating SMS.

-   Support of SoLSA. Support of Localised Service Area interworking is an optional feature. The support for interworking with mobile terminating calls is a requirement, however the specific details of how this will be realised is for further study - $(CAMEL3$)

Detailed information can be found in the respective sections.

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.

- For this Release 1999 document, references to GSM documents are for Release 1999 versions (version 8.x.y).

[1]   ~~GSM 02.93~~TS 22.093: "~~Digital cellular telecommunication system (Phase 2+);~~"Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1".

[2]   ~~GSM 02.79~~TS 22.079: "~~Digital cellular telecommunication system (Phase 2+);~~"Support of Optimal Routeing (SOR); Service definition (Stage 1)".

[3]   ~~GSM 02.30~~TS 22.030: "~~Digital cellular telecommunication system (Phase 2+);~~"Man-machine Interface (MMI) of the Mobile Station (MS) (Stage 1)".

[4]   ~~GSM 02.90~~TS 22.090: "~~Digital cellular telecommunication system (Phase 2+);~~"Stage 1 Decision of Unstructured Supplementary Service Data (USSD)".

[5]   ~~GSM 02.97~~TS 22.097: "~~Digital cellular telecommunication system (Phase 2+);~~"Multiple Subscriber Profile (MSP); Service definition (Stage 1)".

[6]   ~~GSM 02.60~~TS 22.060: "~~Digital cellular telecommunication system (Phase 2+);~~"General Packed Radio Service (GPRS); Service definition (Stage 1)".

[7]   ~~GSM 02.57~~TS 22.057: "~~Digital cellular telecommunication system (Phase 2+);~~"Mobile Station Execution Environment (MExE); Service definition (Stage 1)".

3 Definitions and abbreviations

Operator Specific Service (OSS): Any service offered to a ~~GSM / UMTS~~ mobile user that is not standardised ~~by the GSM specifications~~.

Interrogating PLMN (IPLMN): This is the PLMN that performs the interrogation of the HPLMN for information on the treatment of a terminating call.

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

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

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

Network CAMEL Service Information (N-CSI): The N-CSI identifies services offered on a per-network basis by the serving PLMN operator for all subscribers. - $(CAMEL3$)

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

CAMEL Subscription Information (CSI): The 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.

These OSS may include both services provisioned for individual subscribers and services provisioned equally for all subscribers of an HPLMN. - $(CAMEL3$)

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

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

- **Geographical information** (longitude and latitude)when Cell ID or Location Area Code is known) this 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 resolution and accuracy of the indicated location information may also be provided.

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

- **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 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**: any MS that is not CAMEL-busy or network determined not reachable.

GPRS attach: Is the period where the GPRS subscriber is registered to the GPRS data network. - $(CAMEL3$)

GPRS session: A session starts when a GPRS subscriber activates the start to send or receive data packets and ends when the subscriber deactivates the PDP transport. - $(CAMEL3$)

PDP: Packet Data Protocol (as defined in ~~GSM 02.60~~ TS 22.060 [6]) - $(CAMEL3$)

Route select failure: - $(CAMEL3$)

[test to be added]

Carrier Identification Code: Identifies uniquely the Carrier (NAEA). - $(CAMEL3$)

Carrier Selection Information: Is an indication whether the subscriber selected a carrier, or the carrier is predefined for the subscriber (NAEA). - $(CAMEL3$)

Originating Line Identification: Identifies uniquely the subscriber to be charged for the usage of the carrier (NAEA). - $(CAMEL3$)

Charge Number: Identifies uniquely the organisation to be charged for the usage of the carrier (NAEA). - $(CAMEL3$)

NAEA: North American Equal Access (NAEA). - $(CAMEL3$)

Subscribed Dialled Services: Identifies a set of maximum of ten service numbers. These service numbers are globally available to all HPLMN subscribers. No subscription is needed to access the service numbers within the HPLMN. Each

service number is chosen on the HPLMN operators discretion. In the case of international roaming, the set of service numbers forms a part of the subscribers profile. - $(CAMEL3$)

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

The CAMEL Subscription Information (CSI) is provided by the HPLMN operator by administrative means.

The CSI may include the Translation Information Flag (TIF-CSI). If present for a subscriber the network will apply special handling of the call forwarding supplementary service. For details refer to section 12.3 $(CAMEL2$).

The Network CAMEL Service Information (N-CSI) for network-based services is provided by the serving PLMN operator. The provisioning mechanism is out of the scope of this specification. -$(CAMEL3$).

4.2 General Procedures

Each ~~GSM~~ 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE is defined in the CAMEL Subscription 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; or - $(CAMEL3$);

- the CSE creates a call - $(CAMEL3$).

In addition dialled services may be applicable in a PLMN if the N-CSI is active in the PLMN. -$(CAMEL3$)

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

- Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

- Order in band user interaction -$(CAMEL2$);

- Create additional parties in the call - $(CAMEL3$);

- Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

- Continue the processing of the call, or;

- Connect the calling party to a specified called party;

After one of the above instructions, the relation between the serving network and the CSE shall be released.

It should be possible in the case of serving network-based services to:

- Continue the processing of the call, or;

- Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- MT call;

- MO call (forwarded calls are treated as MO calls);

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service $(CAMEL3$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

4.3 Applicability of CAMEL to Basic Services

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

CAMEL procedures are applicable to GPRS session $(CAMEL3$).

5 Procedures for Mobile Originated Calls and Forwarded Calls

NOTE: Other information elements not listed in the following subclauses may be necessary to meet some Stage 1 service requirements. Refer to the Stage 2 specification GSM 03.78 TS 23.078 for complete information element lists.

5.1 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;

- Detection of unsuccessful call establishment.
  Unsuccessful call establishment may be caused by:

    - called subscriber busy;

    - called subscriber not reachable;

    - no answer from called subscriber;

    - route select failure.

The definition of which of the above initial service events shall initiate contact with the CSE is part of the subscriber's CAMEL subscription information. Only one of the above initial service event is indicated for each OSS.

5.2 Criteria for contact with the CSE $(CAMEL2$)

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

The following criteria may be defined:

5.2.1 CSI criteria applicable at call setup

5.2.1.1 CSI criteria applicable at call setup when dialled digits have been collected $(CAMEL2$)

CSI criteria may be defined for a subscriber for the case where collection of dialled digits has been performed $(CAMEL3$).

- Criteria on the dialled number; these consist of:

    - The contents of the dialled number (a list of up to 10 dialled number strings may be defined in the criteria. Each dialled number string may be in "unknown" or "international" format.);

    - The length of the dialled number (a list of up to three lengths may be defined.).

- The criteria on the dialled number may be collectively defined to be either "enabling" triggering criteria or "inhibiting" triggering criteria (see below). The HPLMN may also choose not to define any criteria on the dialled number.

- A criterion on the basic service: this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

- A criterion on the type of call: this consists of defining whether or not the call must be a forwarded call.

    A call is treated as forwarded in this respect when either a ~~GSM~~ forwarding supplementary service applies or when the call is forwarded as a result of a terminating CAMEL based service. The HPLMN may also choose not to define any criterion on the type of call.

If the criteria on dialled number are "enabling" then the dialled number criteria are satisfied if:

- the dialled number matches a dialled number string defined in the criteria; or

- the length of the dialled number matches a dialled number length defined in the criteria.

If the criteria on the dialled number are "inhibiting" then the dialled number criteria are satisfied if:

- the dialled number does not match any of the dialled number strings defined in the critera; and

-   the length of the dialled number is not the same as any dialled number length defined in the criteria.

In these tests the dialled number matches one of the dialled number strings if:

-   the two numbers are in the same format (unknown or international); and

-   the dialled number is at least as long as the dialled number string in the criteria; and

-   all the digits in the dialled number string in the criteria match the leading digits of the dialled number.

If no criterion on the dialled number is specified then the dialled number criteria are satisfied.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

The criterion on the type of call is satisfied if the type of the call is the same as the type defined in the criterion or if no call type criterion is specified.

The criteria on the call setup event procedure are satisfied if:

-   the criteria on the dialled number are satisfied; and

-   the criterion on the basic service is satisfied; and

-   the criterion on the type of call is satisfied.

6 Procedures for Mobile Terminated Calls

NOTE: Other information elements not listed in the following subclauses may be necessary to meet some Stage 1 service requirements. Refer to the Stage 2 specification GSM 03.78 TS 23.078 for complete information element lists.

10 Procedures for GPRS Data Transmission $(CAMEL3$)

NOTE: Other information elements not listed in the following subclauses may be necessary to meet some Stage 1 service requirements. Refer to the Stage 2 specification GSM 03.78 TS 23.078 for complete information element lists.

10.5 PDP activation / Session Establishment Acknowledgement

The purpose of this procedure is to manage a request from the subscriber to activate a Packet Data Protocol. Note that multiple contacts to the CSE may be made in parallel due to PDP activation / session establishment acknowledgement events being detected whilst a GPRS subscriber is attached to the GSM network.

If either (according to the CSI) :

-   the subscriber is provisioned with a CAMEL based service relevant for GPRS data transmission; and

-   the PDP activation / session establishment acknowledgement is set as a trigger detection point; and

-   criteria permit the contact with the CSE to be established,

or the CSE has activated this service event for the attached and / or active subscriber and the PDP activation acknowledgement event occurs then,

-   the VPLMN shall suspend processing, make contact with the CSE and await further instructions, or,

-   send a notification and continue.

The information listed in table: A-3 (PDP activation / Session Establishment Acknowledgement) shall be provided to the CSE if available.

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

- activate other control service events for the life of the PDP context. The CSE shall have the possibility to send the following information:

    - The service event which shall be detected and reported (including a session reference number):

        - Change of position

        - Data Packet Threshold Procedure (including the type of threshold and when the threshold shall be reached)

        - PDP deactivation procedure;

        - Detach procedure;

    [Editor's note: Change of QoS is for further study.]

- Perform Charging Activities,

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 instruction:

- Release session,

- allow the processing to continue unchanged;

12.2   Notification to CSE of change of subscriber data $(CAMEL3$)

It shall be possible to mark for a subscriber that a notification shall be sent to the CSE when any of the following ~~GSM~~ subscriber data are changed as a result of a request from any entity except the CSE to which the notification shall be sent:

- CF SS data

- CB SS data;

- ODB data;

- CAMEL subscription information

One ore more CSEs may be defined to which the notification shall be sent.

12.3   Supplementary service invocation notification to CSE $(CAMEL2$)

It shall be possible to mark for a subscriber that a notification shall be sent to the CSE when any of the following ~~GSM~~ supplementary services are invoked:

- ECT

- CD

- MPTY

13 CSE control of ~~GSM~~ subscription data $(CAMEL3$)

14.3 Subscriber interaction by using USSD $(CAMEL2$)

It shall be possible for the CSE to initiate a USSD towards the served subscriber at any time. It shall be possible for the CSE to receive a served subscriber initiated USSD at any time (see ~~GSM 02.30~~ TS 22.030 [3] and ~~GSM 02.90~~ TS 22.090 [4]).

14.4 User interaction scripts $(CAMEL3$)

It shall be possible for the CSE to instruct a SRF to execute a logic script which defines the process of a user interaction. The SRF shall be in either the HPLMN or the VPLMN. The SRF shall notify the CSE of the result of executing the logic script.

18 Interactions with supplementary services

18.1 General

This subclause defines the interaction between ~~GSM~~ supplementary services and the CAMEL feature. However, it should be noted that the most effective way to control those service interactions is through managing the provisioning of services. Where possible, subscribers provisioned with services using the CAMEL feature shall not be provisioned with ~~GSM~~ services having an adverse interaction with the CAMEL based services. ~~GSM~~ supplementary services shall not have any knowledge of CAMEL based services.

In general, call independent supplementary service operations (registration, erasure, activation, deactivation and interrogation) are not modified by CAMEL. The exceptions to this for CAMEL phase 2 are the call forwarding services, described in subclause 12.3.1.

18.3 Call Forwarding

$(begin$(CAMEL2$)

For the registration of call forwarding supplementary services the network shall accept any forwarded to number for a subscriber provided with a TIF-CSI. In this case the HPLMN shall treat the forwarded-to number transparently at the time of registration, i.e. it shall not perform validity checks or translations of the format of the number. The forwarding PLMN shall treat the forwarded-to number transparently when the call forwarding service is invoked. The CSE may modify the forwarded-to number within the MO CAMEL Service provided for the subscriber when the call forwarding service is invoked.

> NOTE: Network operators should ensure that the TIF-CSI is provided only to subscribers who are provided with an MO CAMEL service which is capable of translating the registered forwarded-to number.

If the forwarding PLMN does not support CAMEL phase 2, the HPLMN shall consider the call forwarding service as not registered if the forwarded-to number is not stored in international format.

> NOTE: If the served subscriber requires invocation of call forwarding services even when the forwarding PLMN does not support CAMEL phase 2, she has to register a forwarded-to number in E.164 international format.

> NOTE: Network operators should be aware that unpredictable service behaviour could be experienced if the detection points for 'Busy', 'Not Reachable' or 'No Answer' are armed when the corresponding ~~GSM~~ call forwarding supplementary service is active.

$(end$(CAMEL2$)

18.3.1 Call Forwarding Unconditional (CFU)

The Call Forwarding Unconditional service will be invoked after any terminating CAMEL based service. Any forwarded call resulting from a ~~GSM~~ Call Forwarding supplementary service may cause invocation of any mobile originated CAMEL based services.

$(begin$(CAMEL3$)

The CSE shall be able to instruct the forwarding PLMN to suppress the normal handling of Call Forwarding Unconditional and replace it by one or other of the following:

- If Call Forwarding Unconditional is active and operative for the call being processed, the call shall fail, with a reason of Forwarding Violation;

- The call shall be handled as if Call Forwarding Unconditional was not active and operative.

$(end$(CAMEL3$)

18.3.2 Call Forwarding on Busy (CFB)

As for Call Forwarding Unconditional (see subclause 12.3.1).

$(begin$(CAMEL3$)

The CSE shall be able to instruct the forwarding PLMN to suppress the normal handling of Call Forwarding on Busy and to handle the call as if Call Forwarding on Busy was not active and operative.

$(end$(CAMEL3$)

18.7 Advice of Charge (AoC)

Advice of Charge is not guaranteed to operate correctly for calls subject to CAMEL phase 1 based services. It is recommended that subscribers are not provisioned with Advice of Charge and any CAMEL based service for which there is an adverse interaction.

$(begin$(CAMEL2$)

If CAMEL phase 2 is supported and the phase 2 charging function "CSE controlled e-values" is used, the VPLMN shall use the received e-values from the CSE for the purpose of the AoC supplementary service. Once the VPLMN has received e-values from the CSE, only CSE provided e-values are applicable for this call. The e-values shall only be sent by the VPLMN to the MS if the served subscriber is provided with the AoC supplementary service according to ~~GSM 02.86~~TS 22.086.

$(end$(CAMEL2$)

18.8 Call Barring

$(begin$(CAMEL2$)

NOTE: CAMEL may be used to establish forwarded-legs and CAMEL based re-routing-legs that violate conditional ~~GSM~~ outgoing call barring and ODB services. Network operators should take care to avoid problems that may arise because of this interaction.

$(end$(CAMEL2$)

18.8.1 Barring of all outgoing calls

18.8.1.A Mobile originated calls

No interaction. The Barring of all outgoing calls supplementary service will be invoked. Thus, originating CAMEL based services will not be invoked.

18.8.1.B   Forwarded Calls

No interaction. If the Barring of all outgoing calls supplementary service is active and operative, it shall prevent the registration or activation of Call Forwarding as specified in ~~GSM 02.82~~TS 22.082.

[Editor's note: this may be ~~GSM 02.88~~TS 22.088 - needs checking]

18.8.2.2   Forwarded Calls

No interaction. The interaction between call forwarding and call barring is not be modified by CAMEL. This means that the interaction is applied prior to the invocation of call forwarding. When call forwarding is invoked (possibly with originating CAMEL services in the forwarding leg) then the VPLMN or IPLMN shall not apply outgoing call barring services.

$(begin$(CAMEL2$)

If the served subscriber is provided with a TIF-CSI the network shall not perform the interaction of call forwarding services with this barring program, i.e.

-    the registration request is accepted even if this barring program is active and operative;

-    the activation of this barring program is accepted even if a call forwarding supplementary service is active.

When call forwarding is invoked(possibly with originating CAMEL services in the forwarding leg) the VPLMN or IPLMN shall not invoke outgoing call barring services.

$(end$(CAMEL2$)

$(begin$(CAMEL1$)

NOTE: This behaviour means that CAMEL may be used to establish forwarded-legs that violate conditional ~~GSM~~ outgoing call barring and ODB services. Network operators should take care to avoid problems that may arise because of this interaction.

$(end$(CAMEL1$)

18.10   Completion of Call to Busy Subscriber (CCBS)

See ~~GSM 02.93~~ TS 22.093 [1].

18.11   Multiple Subscriber Profile (MSP)

See ~~GSM 02.97~~ TS 22.097 [5].

20   Interactions with Optimal Routeing (OR)

Invocation of OR shall not have any impact of any CAMEL based service.

If OR is applied to a late Call Forward then the interrogating PLMN shall invoke a mobile originated CAMEL based service, if required for the served subscriber.

$(begin$(CAMEL2$)

If OR of a basic mobile-to-mobile call is invoked, mobile originating services based on CAMEL phase 2 which rely on the destination of the MO call leg being determined by the dialled number (in particular, prepayment services) will not necessarily operate correctly.

If OR of late call forwarding is invoked from an IPLMN which is also the forwarding subscriber's HPLMN, then mobile terminating services based on CAMEL phase 2 which rely on the destination of the leg from the IPLMN being determined by the MSRN (in particular, prepayment services) will not necessarily operate correctly.

$(end$(CAMEL2$)

$(begin$(CAMEL3$)

When VPLMN-A contacts the CSE of the originating subscriber, it shall indicate whether it supports OR. If the CSE of the originating subscriber indicates that the call may be subject to basic OR, VPLMN-A shall act as an IPLMN and interrogate HPLMN-B as specified for SOR.

If a call is subject to basic OR, VPLMN-A shall pass the address defining the ultimate destination of the call (whether VPLMN-B, HPLMN-B or the forwarded-to destination) to the CSE of the originating subscriber.

If a call is subject to OR of late call forwarding from an IPLMN which is also the forwarding subscriber's HPLMN, then the IPLMN shall pass the forwarded-to number to the CSE which handles mobile terminating CAMEL-based services for the forwarding subscriber.

    [Editors Note: Interaction with OR LCF R'96 has to be studied and text might be changed.]

$(end$(CAMEL3$)

Specific interaction is described in ~~GSM 02.79~~ TS 22.079 [2].

3G CHANGE REQUEST

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

22.078 **CR** **011**   Current Version: **3.0.0**

3G specification number ↑   *↑ CR number as allocated by 3G support team*

For submission to TSG   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

---

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source: Nokia   **Date:**   21.9.1999

Subject: CAMEL3 interworking with GPRS; Change of position

3G Work item: CAMEL phase 3

Category:	F	Correction	
	A	Corresponds to a correction in a 2G specification	
(only one category	B	Addition of feature	**X**
shall be marked	C	Functional modification of feature	
with an X)	D	Editorial modification	

Reason for change:

–   It could be clarified that SMS applies also in the GPRS case.

–   Change of position in GPRS was marked to be for further study. However, stage 2 and 3 drafts of CAMEL phase 3 already has this functionality. Thus it is reasonable to remove this reservation.

Clauses affected: 4.2 10.6

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other 2G core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

4.2   General Procedures

Each GSM 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE is defined in the CAMEL Subscription 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; or - $(CAMEL3$);

-   the CSE creates a call - $(CAMEL3$).

In addition dialled services may be applicable in a PLMN if the N-CSI is active in the PLMN. -$(CAMEL3$)

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

-   Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

-   Order in band user interaction -$(CAMEL2$);

-    Create additional parties in the call - $(CAMEL3$);

-    Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

-   Continue the processing of the call, or;

-   Connect the calling party to a specified called party;

After one of the above instructions, the relation between the serving network and the CSE shall be released.

It should be possible in the case of serving network-based services to:

-   Continue the processing of the call, or;

-   Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- MT call;

- MO call (forwarded calls are treated as MO calls);

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service; both via MSC and SGSN of GPRS $(CAMEL3$).

- GPRS $(CAMEL3$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

10 Procedures for GPRS Data Transmission $(CAMEL3$)

………………………

10.6 Change of Position Procedure ~~(for further study)~~

The purpose of this procedure is to detect a request from the GPRS subscriber for update the actual routing area, i.e. to change from one SGSN to another SGSN.

If the CSE has activated this service event for the session and a request to change the position occurs, the VPLMN shall send a notification and continue.

The following information shall be provided to the CSE if available:

- Event met;

- New routing area;

3G CHANGE REQUEST

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

22.078 **CR** **012**   Current Version: 3.0.0

3G specification number ↑   ↑ *CR number as allocated by 3G support team*

For submision to TSG   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

---

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source:	Nokia	**Date:**	21.9.1999

Subject:	CAMEL3 DTMF Mid-Call corrections and clarifications

3G Work item:	CAMEL phase 3

Category: F   Correction   ☐

                       A   Corresponds to a correction in a 2G specification   ☐

(only one category   B   Addition of feature   ☐

shall be marked   C   Functional modification of feature   **X**

with an X)   D   Editorial modification   ☐

Reason for change:

– For easier handling of triggering criteria the DTMF Mid-Call criteria shall be cleared when triggering occurs. Otherwise gsmSSF implementation becames complicated- especially in the case if the same digit string belongs to an individual criterion and list simultaneously.

– DTMF Mid-Call should be allowed to be armed also when CSE relationship is initiated in the *unsuccessful call establishment procedure*. Supposeably there is also no reason to

prohibit arming of Mid-Call in O/T_Disconnect EDP.

Clauses affected:

Other specs   Other 3G core specifications   [ ]   → List of CRs:

affected: Other 2G core specifications   [ ]   → List of CRs:

MS test specifications   [ ]   → List of CRs:

BSS test specifications   [ ]   → List of CRs:

O&M specifications   [ ]   → List of CRs:

Other comments:

5.7 Mid call procedure $(CAMEL3$)

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the originating subscriber using the DTMF procedure shall be matched.

The criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).

When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disable all entries from the criterion list.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for this call and a mid-call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the VPLMN 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;

- event specific data:

    - received DTMF digits.

When the 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 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:

        - Call disconnection;

        - Mid call event (DTMF);

    - The party in the call for which the event shall be detected and reported (calling or a called party);

    - The type of monitoring (control or notification).

- Create additional parties in the call (refer to Section 'Creation of called parties');

- Put call parties on hold;

- Remove individual call parties from the call;

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call;

- 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 instruction:

- allow the call processing to continue unchanged, or;

- release the call;

5.8　　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 service event for this call and the call disconnection event occurs the VPLMN 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.

$(begin$(CAMEL2$)

When the 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 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:

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

        - Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

    - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction.

$(end$(CAMEL2$)

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 instruction:

- allow the call processing to continue unchanged, i.e. to release the call;

$(begin$(CAMEL2$)

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call disconnection procedure (MO)):

$(end$(CAMEL2$)

6.5 Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an incoming call set-up at the time when the call establishment is unsuccessful.

If the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the IPLMN 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;

- Type of monitoring;

- Cause for unsuccessful call establishment:

    - not reachable;

    - busy;

    - no answer.

When the IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN 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:

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

        - Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

    - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- 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. The CSE shall have the possibility to send the information listed in table: A-2 (Unsuccessful call establishment (MT)).

- release call

6.7 Mid Call procedure $(CAMEL3$)

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the terminating subscriber using the DTMF procedure shall be matched.

The criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).

When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disable all entries from the criterion list.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for this call and a mid call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the IPLMN 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;

- event specific data:

    - received DTMF digits.

When the IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN 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:

        - Call disconnection;

        - Mid call event (DTMF).

    - The party in the call for which the event shall be detected and reported (calling or a called party);

    - The type of monitoring (control or notification).

- Create additional parties in the call (refer to Section 'Creation of called parties');

- Put call parties on hold;

- Remove individual call parties from the call;

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call;

- 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 instruction:

- allow the call processing to continue unchanged, or;

- release the call

6.8   Call disconnection procedure

The purpose of this procedure is to manage the actions on disconnection of an established call.

If the CSE has activated this service event for this call and the call disconnection event occurs the IPLMN 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.

$(begin$(CAMEL2$)

When the IPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN 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:

    - Called party connection;

    - Call disconnection;

    - Calling party abandon;

    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

    - Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

  - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction.

$(end$(CAMEL2$)

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 instruction:

- allow the call processing to continue unchanged, i.e. to release the call;

$(begin$(CAMEL2$)

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call disconnection procedure (MT)).

$(end$(CAMEL2$)

3G CHANGE REQUEST

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

| **22.078** | CR | **013** | Current Version: | 3.0.0 |

3G specification number ↑ ↑ *CR number as allocated by 3G support team*

For submision to TSG

list TSG meeting no. here ↑

for approval **X**

for information

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM ☐ ME ☐ UTRAN ☐ Core Network **X**

(at least one should be marked with an X)

| **Source:** | Nokia | **Date:** | 21.9.1999 |

| **Subject:** | CAMEL3 clean-up of IPLMN and VPLMN references |

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

Category:	F	Correction	**X**
	A	Corresponds to a correction in a 2G specification	
(only one category	B	Addition of feature	
shall be marked	C	Functional modification of feature	
with an X)	D	Editorial modification	

Reason for change:	– Call forwarding can take place in GMSC, i.e. in IPLMN.
	– CAMEL phase ¾ will include T-BCSM in VMSC, i.e. in VPLMN.
	– Alerting pattern can be sent to T-BCSM of VMSC.
	– AoC is applicable for MT calls in VMSC

- DTMF Mid Call is applicable only in the VMSC, i.e. in VPLMN.

Clauses affected:

Other specs   Other 3G core specifications   [ ]   → List of CRs:

affected: Other 2G core specifications   [ ]   → List of CRs:

   MS test specifications   [ ]   → List of CRs:

   BSS test specifications   [ ]   → List of CRs:

   O&M specifications   [ ]   → List of CRs:

Other comments:

5 Procedures for Mobile Originated Calls and Forwarded Calls

…….

5.3 Call set-up request procedure

5.3.1 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 (according to the CSI):

- the subscriber is provisioned with a CAMEL based originating service; and

- the call set-up request occurs; and

- the criteria are satisfied $(CAMEL2$).

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

For mobile originated calls the information listed in table: A-1 (Call set-up request procedure 1) shall be provided to the CSE if available.

For forwarded calls the information listed in table: A-1 (Call set-up request procedure 2) shall be provided to the CSE if available.

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

- perform charging activities; $(CAMEL2$);

- 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:

    - Called party connection;

    - Call disconnection;

    - Calling party abandon -$(CAMEL2$);

    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer - $(CAMEL2$); The CSE may specify the distinct unsuccessful case(s) for which the instruction is valid. $(CAMEL3$);

    - Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

  - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Connect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction. $(CAMEL2$).

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);

- allow the call processing to continue unchanged;

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call set up request procedure 1).

5.3.2 Procedure for subscribed dialled services $(CAMEL3$)

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 dialled services information, 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.

5.3.2.1 Initiation of contact with the CSE

If (according to the CSI):

- the subscriber is provisioned with a CAMEL based originating service; and

- the call set-up request occurs; and

- the criteria are satisfied.

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

Note that contact to the CSE shall (if necessary) be made in this manner before network dialled services are invoked;

For mobile originated calls the information listed in table: A-1 (Call set-up request procedure 3) shall be provided to the CSE if available.

For forwarded calls the information listed in table: A-1 (Call set-up request procedure 4) shall be provided to the CSE if available.

5.3.2.2 Further processing of the call

When the VPLMN/IPLMN has made contact with the CSE (or reported events to the CSE when contact has already been established), the CSE shall be able to instruct the VPLMN/IPLMN to act as described below by issuing one and only one of the following instructions:

- allow the call processing to continue unchanged;

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call set up request procedure 2).

Further processing of the call continues as detailed in Sections 5.3 to 5.8, and the CSE contact initiated at this procedure is terminated.

5.4 Calling party abandon $(CAMEL2$)

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 service event for this call and the calling party abandon event occurs the VPLMN/IPLMN shall:

- notify the CSE and continue.

The following information shall be provided to the CSE:

- Event met;

- Type of monitoring;

$(begin$(CAMEL3$)

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

When the VPLMN/IPLMN has made contact with the CSE in request mode, the CSE shall be able to instruct the VPLMN/IPLMN 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:

- allow the call processing to continue unchanged.

$(end$(CAMEL3$)

5.5 Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an outgoing call set-up at the time when the call establishment is unsuccessful.

If no control relationship for the given call exists and

- the unsuccessful call establishment procedure is defined as initial service event (according to the CSI); and

- the call attempt is unsuccessful; and

- the triggering criteria are satisfied .

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

If a relationship for the given call already exists and the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the VPLMN/IPLMN 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

If the unsuccessful call procedure is armed as a initial service event, the information listed in table: A-1 (Unsuccessful call establishment) shall be provided to the CSE additionally if available. - $(CAMEL3$)

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

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

        - Mid call event (DTMF) $(CAMEL3$);

    - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- 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. The CSE shall have the possibility to send the following information listed in table: A-2 (Unsuccessful call establishment (MO)).

- release call

5.6 Called party connection procedure

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

If the CSE has activated this service event for this call and the called party connection event occurs the VPLMN/IPLMN 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 VPLMN/_IPLMN_ has made contact with the CSE, the CSE shall be able to instruct the VPLMN/_IPLMN_ 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:

        -   Call disconnection;

        -   Mid call event (DTMF) $(CAMEL3$);

    -   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).

-   Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

-   Put call parties on hold - $(CAMEL3$);

-   Remove individual call parties from the call - $(CAMEL3$);

-   Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

-   Order in-band user interaction $(CAMEL3$).

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;

-   allow the call processing to continue unchanged;

5.7   Mid call procedure $(CAMEL3$)

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the originating subscriber using the DTMF procedure shall be matched.

The criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).

When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for this call and a mid-call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the VPLMN 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;

- event specific data:

    - received DTMF digits.

When the 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 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:

        - Call disconnection;

        - Mid call event (DTMF);

    - The party in the call for which the event shall be detected and reported (calling or a called party);

    - The type of monitoring (control or notification).

- Create additional parties in the call (refer to Section 'Creation of called parties');

- Put call parties on hold;

- Remove individual call parties from the call;

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call;

- 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 instruction:

- allow the call processing to continue unchanged, or;

- release the call;

5.8   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 service event for this call and the call disconnection event occurs the VPLMN/IPLMN 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.

$(begin$(CAMEL2$)

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

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

    - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction.

$(end$(CAMEL2$)

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 instruction:

- allow the call processing to continue unchanged, i.e. to release the call;

$(begin$(CAMEL2$)

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call disconnection procedure (MO)):

$(end$(CAMEL2$)

6   Procedures for Mobile Terminated Calls

……

6.3   Incoming call request procedure

The purpose of this procedure is to detect an incoming call request and allow the CSE to modify the handling of the incoming call.

If (according to the CSI):

- the subscriber is provisioned with a CAMEL based terminating service; and

- the incoming call request event occurs

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

For mobile terminated calls the following information listed in table: A-1 (Incoming call request procedure) shall be provided to the CSE if available.

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

- perform charging activities; -$(CAMEL2$)

- 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:

        - Called party connection;

        - Call disconnection;

        - Calling party abandon -$(CAMEL2$);

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer $(CAMEL2$). The CSE may specify the distinct unsuccessful case(s) for which the instruction is valid. $(CAMEL3$);

        - Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

    - 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).

  $(begin$(CAMEL3$)-   activate control service events for the originating call leg. The CSE shall have the possibility to send the following information: :

    - The service event which shall be detected and reported:

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. The CSE may specify the distinct unsuccessful case(s) for which the instruction is valid.;

        - Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid.

- The party in the call for which the event shall be detected and reported (calling or called party);

$(end$(CAMEL3$)

- suppress tones and announcements which may be played to the calling party, if an unsuccessful call establishment occurs.

    $(begin$(CAMEL1$)

    This is only applicable when the called party number is unchanged by the CSE.

    $(end$(CAMEL1$)

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction.$(CAMEL2$)

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);

- allow the call processing to continue unchanged;

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Incoming call request procedure).

In the case the CSE instructs the IPLMN/VPLMN to allow the call processing with a changed called party number, the CSE shall indicate whether the resulting call shall be treated by the IPLMN/VPLMN as a forwarded call or not. Any forwarded call resulting from a CSE Call Forwarding service may cause an invocation of any mobile originated CAMEL based service in the IPLMN/VPLMN.

$(begin$(CAMEL2$)

In the case the CSE instructs the IPLMN to allow the call processing with modified information, the CSE may send to the IPLMN an alerting pattern in order to alert the called subscriber in a specific manner. This alerting pattern shall be transferred to the VPLMN.

$(end$(CAMEL2$)

$(begin$(CAMEL3$)

In the case the CSE instructs the VPLMN to allow the call processing with modified information, the CSE may send to the VPLMN an alerting pattern in order to alert the called subscriber in a specific manner.

$(end$(CAMEL3$)

6.4 Calling party abandon $(CAMEL2$)

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

If the CSE has activated this service event for this call and the calling party abandon event occurs the IPLMN/VPLMN shall:

- notify the CSE and continue.

The following information shall be provided to the CSE:

- Event met;

- Type of monitoring;

$(begin$(CAMEL3$)

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

When the IPLMN/VPLMN has made contact with the CSE in request mode, the CSE shall be able to instruct the IPLMN/VPLMN 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:

- allow the call processing to continue unchanged;

$(end$(CAMEL3$)

6.5 Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an incoming call set-up at the time when the call establishment is unsuccessful.

If the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the IPLMN/VPLMN 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;

- Type of monitoring;

- Cause for unsuccessful call establishment:

    - not reachable;

    - busy;

    - no answer.

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

        - Called party connection;

        - Call disconnection;

        - Calling party abandon;

        - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

    - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- 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. The CSE shall have the possibility to send the information listed in table: A-2 (Unsuccessful call establishment (MT)).

- release call

6.6 Called party connection procedure

The purpose of this procedure is to manage an incoming call set-up at the time when the called party answers and the call is successfully established.

If the CSE has activated this service event for this call and the called party connection event occurs, the IPLMN/VPLMN 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 IPLMN/VPLMN has made contact with the CSE, the CSE shall be able to instruct the IPLMN/VPLMN to act as described below.

- perform charging activities;$(CAMEL2$)

- 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:

    - (Call disconnection);

    - Mid call event (DTMF) $(CAMEL3$);

  - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction. - $(CAMEL3$);

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;

- allow the call processing to continue unchanged;

6.7 Mid Call procedure $(CAMEL3$)

When the CSE instructs the VPLMN to arm the mid-call event it shall specify a criterion against which digits entered by the terminating subscriber using the DTMF procedure shall be matched.

The criterion consists of a list of up to 3 entries. Each entry is either a digit string or a definition of a range. A range definition consists of a lower bound followed by an upper bound. The lower bound and the upper bound are each digit strings. A digit string shall be at least 1 digit and at most 6 digits. Each digit shall be taken from the ordered set (0 - 9, *, #, A, B, C, D).

When collecting digits, the VPLMN shall consider a digit which follows the first digit of the string to be part of the string only if the interval between successive digits does not exceed 4 seconds.

The criterion for the mid-call DP is satisfied if the digits collected from the subscriber match the digits in a digit string in the criterion, or if the digits collected from the subscriber are included in a range defined in the criterion. Triggering of the mid-call event shall occur immediately after the criterion has been satisfied.

Digits collected from the subscriber shall be relayed as DTMF towards the destination subscriber independent of any CAMEL processing.

If the CSE has activated this service event for this call and a mid call event (as determined by the criterion for the mid-call procedure being satisfied) occurs the IVPLMN 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;

- event specific data:

  - received DTMF digits.

When the IVPLMN has made contact with the CSE, the CSE shall be able to instruct the IVPLMN 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:

    - Call disconnection;

    - Mid call event (DTMF).

  - The party in the call for which the event shall be detected and reported (calling or a called party);

  - The type of monitoring (control or notification).

- Create additional parties in the call (refer to Section 'Creation of called parties');

- Put call parties on hold;

- Remove individual call parties from the call;

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call;

- 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 instruction:

- allow the call processing to continue unchanged, or;

- release the call

6.8 Call disconnection procedure

The purpose of this procedure is to manage the actions on disconnection of an established call.

If the CSE has activated this service event for this call and the call disconnection event occurs the IPLMN/VPLMN 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.

$(begin$(CAMEL2$)

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

    - Called party connection;

    - Call disconnection;

    - Calling party abandon;

    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

  - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction.

$(end$(CAMEL2$)

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 instruction:

- allow the call processing to continue unchanged, i.e. to release the call;

$(begin$(CAMEL2$)

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call disconnection procedure (MT)).

$(end$(CAMEL2$)

6.9 CSE initiated call release procedure

Following the CAMEL processing of the incoming call 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 CSE shall previously have activated at least one of these service events. [with "Type of

15 Charging Activities $(CAMEL2$)

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

- calls may be divided into call periods for the purpose to control the call duration;

- the management and the control of a tariff switch which applies to subscriber charging is under the responsibility of the HPLMN. The time at which the tariff switches applies shall be the same for the control of e-values and for the control of the call duration;

- the tariff switch time is indicated to the network in form of a relative time to the reception of the instruction.

15.1 CSE controlled e-values

If the subscriber is provisioned with a CAMEL based service and if a contact exists between the ~~IPLMN/~~VPLMN and the CSE, the CSE shall be able to send e-values for the Advice of Charge supplementary service.

For the purpose of charge indication on the MS even when one (or more) tariff switch occurs during the call, several sets of e-values may be sent by the CSE to the ~~IPLMN/~~VPLMN and transmitted in sequence to the Mobile Station.

Before the call is answered, the CSE may send either one set or two set 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 the call is answered;

- If two sets are sent, then:

    - a tariff switch time when the second set becomes valid must also be sent;

    - the first set of e-values is applicable from the beginning of the call except in the case where the tariff switch time occurs before the call is answered, then the second set of e-values is applicable at 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 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, if available.

3G CHANGE REQUEST

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

22.078 **CR** **014**   Current Version: **3.0.0**

3G specification number ↑   *↑ CR number as allocated by 3G support team*

For submision to TSG   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM   ME   UTRAN   Core Network   **X**

(at least one should be marked with an X)

Source:	Nokia	**Date:**	21.9.1999

Subject:	Defining successful SM submission to SMSC as EDP (CAMEL3)

3G Work item:	CAMEL phase 3

Category: F   Correction

              A   Corresponds to a correction in a 2G specification

(only one category   B   Addition of feature

shall be marked   C   Functional modification of feature   **X**

with an X)   D   Editorial modification

Reason for change: For the purpose of control of an MO SMS, the CSE may arm the unsuccessful submission of the Short Message to the SMSC as an EDP.

In order to be able to offer meaningful services, it should be possible for the CSE to arm the successful submission of the Short Message to the SMSC as an EDP as well.

The present CR adds this EDP to the description of CAMEL control of MO SMS.

Clauses affected:

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other 2G core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

9 Procedures for SMS $(CAMEL3$)

9.1 Short message submission request procedure

The purpose of this procedure is to detect a SMS set-up request and allow the CSE to modify the handling of the SMS set-up request.

If (according to the CSI) :

- the subscriber is provisioned with a CAMEL based SMS originating service; and

- the SMS set-up request occurs;

Then the VPLMN shall suspend SMS processing, make contact with the CSE and await further instructions.

For mobile originated SMS the following information shall be provided to the CSE if available:

- Event met;

- IMSI;

- Identity of the originator of the SM (SIM, ME, User);

- SMSC address;

- Calling Party's Number;

- Service Key;

- Location information of the calling subscriber;

- time zone;

- Called Party Number.

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

- perform charging activities (inclusion in charging record of information received from the CSE);

- activate other control service events for the SM submission. The CSE shall have the possibility to send the following information:

  - The service event which shall be detected and reported:

    - Successful SM submission to the SMSC

    - Unsuccessful SM submission to the SMSC

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

- bar the SM submission;

- allow the submission to continue unchanged;

- allow the SMS processing with modified information. The CSE shall have the possibility to send the following information:

  - Called Party Number;

  - Calling Party's Number;

  - SMSC address.

In the case where the SM submission is barred, the served subscriber shall be informed.

CHANGE REQUEST No :	**015**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG   #30   for approval   **X**   without presentation ("non-strategic")
list SMG plenary meeting no. here ↑   for information   with presentation ("strategic")   **X**

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Mannesmann Mobilfunk   **Date:**   1999 – 09 – 01

Subject: Interworking with SAT and MExE !

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

Reason for change: SMG1 decided to include the possibility for SAT & MExE applications to interwork with CAMEL.
.

Clauses affected: 9, 21 (new); 22; A.1; A.2; A.3

Other specs affected:
Other releases of same spec [ ]   → List of CRs:
Other core specifications [ ]   → List of CRs:
MS test specifications / TBRs [ ]   → List of CRs:
BSS test specifications [ ]   → List of CRs:
O&M specifications [ ]   → List of CRs:

Other comments:

9 Procedures for SMS $(CAMEL3$)

9.1 Short message submission request procedure

The purpose of this procedure is to detect a SMS set-up request and allow the CSE to modify the handling of the SMS set-up request.

If (according to the CSI) :

- the subscriber is provisioned with a CAMEL based SMS originating service; and

- the SMS set-up request occurs;

Then the VPLMN shall suspend SMS processing, make contact with the CSE and await further instructions.

For mobile originated SMS the following information shall be provided to the CSE if available:

- Event met;

- IMSI;

- Identity of the originator of the SM (SIM, ME, User);

- SMSC address;

- Calling Party's Number;

- Service Key;

- Location information of the calling subscriber;

- time zone;

- Called Party Number;

- MExE / SAT application identifier

- MExE / SAT Free formatted information.

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

- perform charging activities (inclusion in charging record of information received from the CSE);

- activate other control service events for the SM submission. The CSE shall have the possibility to send the following information:

  - The service event which shall be detected and reported:

    - Unsuccessful SM submission.

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

- bar the SM submission;

- allow the submission to continue unchanged;

- allow the SMS processing with modified information. The CSE shall have the possibility to send the following information:

  - Called Party Number;

  - Calling Party's Number;

  - SMSC address.

In the case where the SM submission is barred, the served subscriber shall be informed.

****   NEXT MODIFIED SECTION   ****

---

20   Interactions with Optimal Routeing (OR)

Invocation of OR shall not have any impact of any CAMEL based service.

If OR is applied to a late Call Forward then the interrogating PLMN shall invoke a mobile originated CAMEL based service, if required for the served subscriber.

$(begin$(CAMEL2$)

If OR of a basic mobile-to-mobile call is invoked, mobile originating services based on CAMEL phase 2 which rely on the destination of the MO call leg being determined by the dialled number (in particular, prepayment services) will not necessarily operate correctly.

If OR of late call forwarding is invoked from an IPLMN which is also the forwarding subscriber's HPLMN, then mobile terminating services based on CAMEL phase 2 which rely on the destination of the leg from the IPLMN being determined by the MSRN (in particular, prepayment services) will not necessarily operate correctly.

$(end$(CAMEL2$)

$(begin$(CAMEL3$)

When VPLMN-A contacts the CSE of the originating subscriber, it shall indicate whether it supports OR. If the CSE of the originating subscriber indicates that the call may be subject to basic OR, VPLMN-A shall act as an IPLMN and interrogate HPLMN-B as specified for SOR.

If a call is subject to basic OR, VPLMN-A shall pass the address defining the ultimate destination of the call (whether VPLMN-B, HPLMN-B or the forwarded-to destination) to the CSE of the originating subscriber.

If a call is subject to OR of late call forwarding from an IPLMN which is also the forwarding subscriber's HPLMN, then the IPLMN shall pass the forwarded-to number to the CSE which handles mobile terminating CAMEL-based services for the forwarding subscriber.

   [Editors Note: Interaction with OR LCF R'96 has to be studied and text might be changed.]

$(end$(CAMEL3$)

Specific interaction is described in GSM 02.79 [2].

---

21   Interactions with SAT and MExE

For interworking purposes SAT and MExE applications shall be able to include free formatted information in the call set up for MO-calls (mobile originated calls), MO-SMS (mobile originated SMS) and GPRS session set up. This information shall be forwarded transparently to a CAMEL-CSE.

A CAMEL-CSE shall be able to include free formatted information for MT-calls (mobile terminated calls) that shall be forwarded transparently to a SAT or MExE application.

2<u>2</u>1 Cross Phase compatibility with future Phases of CAMEL

**** NEXT MODIFIED SECTION ****

A.1 Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various events. The numbers are reflecting the applicable Camel phase (1, 2, 3).

	Call set-up request procedure 1 (MO)	Call set-up request procedure 2 (CF)	Call set-up request procedure 3 (MO)	Call set-up request procedure 4 (CF)	Unsuccessful call establishment (MO)	Unsuccessful call establishment (CF)	Incoming call request procedure (MT)	Procedures for serving network dialled services 1	Procedures for serving network dialled services 2
Event met	1	1	3	3	2	2	1	3	3
IMSI	1	1	3	3	2	2	1	3	3
Calling Party's Number	1	1	3	3	2	2	1	3	3
Calling Party's Category	1	1	3	3	2	2	1	3	3
Additional Calling Party Number	-	1	-	3	-	2	1	-	3
Called Party BCD Number	1	-	3	-		-	-	3	-
Called Party Number	-	1	-	3	2	2	1	-	3
Original Called Party Number	-	1	-	3	-	2	1	-	3
Redirecting (Party) Number ????	-	1	-	3	-	2	1	-	3
Redirection Information	-	1	-	3	-	2	1	-	3
Service Key	1	1	3	3	2	2	1	3	3
ISDN Bearer Capability	1	1	3	3	2	2	1	3	3
High Layer Compatibility	1	1	3	3	2	2	1	3	3
Basic Service Code	1	1	3	3	2	2	1	3	3
Call Identification Information	1	1	3	3	2	2	-	3	3
Location Information of the Calling Subscriber	1	-	3	-	2	-	-	3	3
Location Number of the Calling Subscriber	-	-	-	-	-	-	1	-	-
Location information of the called subscriber	-	-	-	-	-	-	1	-	-
Subscriber State of the called subscriber	-	-	-	-	-	-	1	-	-
Time and Time Zone Information - $(CAMEL2$)	2	2	3	3	2	2	2	3	3
Optimal Routing Indication - $(CAMEL3$)	3	3	3	3	3	2	-	3	3
Calling Party LSA (if available) $(CAMEL3$)	3	-	3	-	3	-	-	3	-
IMEI -$(CAMEL3$)	3	-	3	-	3	-	-	3	-
Terminal characteristics and capabilities (see MExE, 02.57) -$(CAMEL3$)	3	-	3	-	3	-	-	3	-
MExE classmark (see MExE, 02.57) -$(CAMEL3$)	3	-	3	-	3	-	-	3	-
MExE / SAT application identifier -$(CAMEL3$)	3	=	3	=	3	=	=	3	=
MExE / SAT Free formatted information - $(CAMEL3$)	3	=	3	=	3	=	=	3	=
NAEA Carrier Identification Code (CIC) - $(CAMEL2$)	2	2	3	3	2	2	2	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) -$(CAMEL2$)	2	2	3	3	2	2	2	3	3

Table A-1: Information transferred towards the CSE.

A.2 Information sent by the CSE

The following table shows the information that is sent by the CSE on various events. The numbers are reflecting the applicable Camel phase (1, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Unsuccessful call establishment (MO)	Call disconnection procedure (MO)	Creation of called parties	Incoming call request procedure	Unsuccessful call establishment (MT)	Call disconnection procedure (MT)	Procedures for serving network dialled services	CSE initiated call set up
Called Party Number	1	3	2	2	3	1	2	2	3	3
Calling Party Number	-	-	-	-	3	-		-	-	3
Calling Party's Category	1	3	2	2	3	1	2	2	3	3
Calling IMSI	-	-	-	-	-	-	-	-	-	3
ISUP CUG information	-	-	-	-	3	-	-	-	-	-
Additional Calling Party's Number	1	3	2	2	3	1	2	2	3	3
Original Called Party Number	1	3	2	2	-	1	2	2	3	-
Redirection Party Number	1	3	2	2	3	1	2	2	3	-
Redirection Information	1	3	2	2	3	1	2	2	3	-
Alerting Pattern	-	-	-	-	3	2	-	-	-	3
ISDN Access releated Information	-	-	-	-	3	-	-	-	-	3
ISDN Bearer Capability	-	-	-	-	3	-	-	-	-	3
High Layer Compatibility	-	-	-	-	3	-	-	-	-	3
Basic Service Code	-	-	-	-	3	-	-	-	-	3
Called Party to be Created	-	-	-	-	3	-	-	-	-	3
New Call Segment	-	-	-	-	3	-	-	-	-	3
In Service Compatibility Response	-	-	-	-	3	-	-	-	-	3
Service Interaction Indicators Two	-	-	-	-	3	-	-	-	-	3
Location Number	-	-	-	-	3	-	-	-	-	3
Optimal Routing Indication $(CAMEL3$)	3	3	3	3	3	3	3	3	-	3
MExE / SAT Free formatted information - $(CAMEL3$)	=	=	=	=	=	3	=	=	=	=
NAEA Carrier Identification Code (CIC) - $(CAMEL2$)	2	2	2	2	3	2	2	2	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) - $(CAMEL2$)	2	2	2	2	3	2	2	2	3	3
NAEA Originating Line Identification (OLI) - $(CAMEL2$)	2	2	2	2	3	2	2	2	3	3
NAEA Charge Number (CN) - $(CAMEL2$)	2	2	2	2	3	2	2	2	3	3
CSE Address	-	-	-	-	-	-	-	-	-	3

Table A-2: Information sent by the CSE.

A.3   GPRS Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various GPRS events. The numbers are reflecting the applicable Camel phase (3).

	Attach procedure	PDP activation / Session Establishment	PDP activation / Session Establishment Acknowledgement
Event met	3	3	3
Type of monitoring	-	3	3
MSISDN	3	3	3
IMSI	3	3	3
Service Key	3	3	3
Location information at least to the resolution of Routing Area of the attaching subscriber	3	3	3
Time stamp information	3	3	3
Time zone information	3	3	3
GPRS MS Class	3	3	3
MExE / SAT application identifier	3	3	3
MExE / SAT Free formatted information	3	3	3
PDP transport protocol, i.e. IP or X.25	-	3	3
Quality of Service information (subscribed, requested,	-	3	3
Destination address information	-	3	3
GPRS charging correlation ID	-	-	3
Destination address information	-	-	3

Table A-3: GPRS Information transferred towards the CSE.

CHANGE REQUEST No :	**016**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS:	22.078	Version:	3.0.0

Submitted to SMG #30
list SMG plenary meeting no. here ↑

for approval **X**
for information ☐

without presentation ("non-strategic") ☐
with presentation ("strategic") **X**

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Mannesmann Mobilfunk   **Date:** 1999 – 09 – 01

Subject: Correction Annex A.2; Information sent by the CSE

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

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

Reason for change: The present CR corrects the relation between information elements sent by the CSE and the procedures where it applies.

Clauses affected: Annex A, A.2

Other specs affected:

Other releases of same spec	☐	→ List of CRs:	
Other core specifications	☐	→ List of CRs:	
MS test specifications / TBRs	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments: This CR is based on the assumption that the CR (A056) in T-Doc 1-99-342 was adopted first!

A.2   Information sent by the CSE

The following table shows the information that is sent by the CSE on various events. The numbers are reflecting the applicable Camel phase (1, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Unsuccessful call establishment (MO)	Call disconnection procedure (MO)	Creation of called parties	Incoming call request procedure	Unsuccessful call establishment (MT)	Call disconnection procedure (MT)	Procedures for serving network dialled services	CSE initiated call set up
Called Party Number	1	3	2	2	3	1	2	2	3	3
Calling Party Number	-	-	-	-	3	-	2	-	-	3
Calling Party's Category	1	3	2	2	3	1	2	2	3	3
Calling IMSI	-	-	-	-	-	-	-	-	-	3
ISUP CUG information	-	-	-	-	3	-	-	-	-	-
Additional Calling Party's Number	1	3	2	2	3	1	2	2	3	3
Original Called Party Number	1	3	2	2	-	1	2	2	3	-
Redirection Party Number	1	3	2	2	3	1	2	2	3	-
Redirection Information	1	3	2	2	3	1	2	2	3	-
Alerting Pattern	-	-	-	-	3	2	-	-	-	3
ISDN Access releated Information	-	-	-	-	3	-	-	-	-	3
ISDN Bearer Capability	-	-	-	-	3	-	-	-	-	3
High Layer Compatibility	-	-	-	-	3	-	-	-	-	3
Basic Service Code	-	-	-	-	3	-	-	-	-	3
Called Party to be Created	-	-	-	-	3	-	-	-	-	3
New Call Segment	-	-	-	-	3	-	-	-	-	3
In Service Compatibility Response	-	-	-	-	3	-	-	-	-	3
Service Interaction Indicators Two	-	-	-	-	3	-	-	-	-	3
Location Number	-	-	-	-	3	-	-	-	-	3
Optimal Routing Indication $(CAMEL3$)	3	3	3	3	3	3	3	3	-	3
NAEA Carrier Identification Code (CIC) - $(CAMEL3$)	2	2	2	2	3	2	2	2	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) - $(CAMEL3$)	2	2	2	2	3	2	2	2	3	3
NAEA Originating Line Identification (OLI) - $(CAMEL3$)	2	2	2	2	3	2	2	2	3	3
NAEA Charge Number (CN) - $(CAMEL3$)	2	2	2	2	3	2	2	2	3	3
CSE Address	-	-	-	-	-	-	-	-	-	3

Table A-2: Information sent by the CSE.

CHANGE REQUEST No :   **017**

Technical Specification GSM   **22.078**   Version: **3.0.0**

Submitted to SMG   **#30**   for approval   **X**   without presentation ("non-strategic")

for information   with presentation ("strategic")

Proposed change affects: SIM ☐   ME ☐   Network **X**

Work item: CAMEL phase 3

Source: Ericsson   **Date:**   27-09-1999

Subject: Corrections to CAMEL interworking with GPRS

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

Reason for change: The present CR corrects, clarifies or modifies the following aspects of CAMEL interworking with GPRS.

1. The CSE shall not be able to instruct the SGSN to use 'number of packets' as a data threshold criterion. The criteria that may be given by the CSE shall be 'allowed time' and 'total amount

    Rationale is that the size of packets is unpredicatable and there exists therefore no requirement to monitor packets.

2. When the CSE defines a threshold for a Session or PDP Context in terms of a 'total amount of transmitted data', this shall be the sum of the total amount of data *sent by* the GPRS Terminal and the total amount of data *received by* the terminal.
    This requirements is currently not properly specified.

The current description specifies EDP-N only.

12. Sect. 10.10 and 10.11 need to be rephrased.
    When the CSE intends to release a Session or a PDP Context, there shall be at least one service event armed with monitoring type 'control' *at that moment*, or the gprsSSF is in state Waiting

for Instructions.

13. A section on the charging capabilities of the CSE for GPRS has been added to section 10.

14. A section on 'Change of QoS for PDP Context' has been added to section 10.

Clauses affected: 10

Other specs   Other releases of same spec   ☐   → List of CRs:

affected: Other core specifications   ☐   → List of CRs:

      MS test specifications / TBRs   ☐   → List of CRs:

      BSS test specifications   ☐   → List of CRs:

      O&M specifications   ☐   → List of CRs:

Other comments:

10 Procedures for GPRS Data Transmission $(CAMEL3$)

NOTE: Other information elements not listed in the following subclauses may be necessary to meet some Stage 1 service requirements. Refer to the Stage 2 specification GSM 03.78 for complete information element lists.

10.1 Initial service events

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

- Attach procedure: a subscriber requests to register to the GPRS network

- PDP Activation / Session Establishment: a subscriber requests the activation of a Packet Data Protocol Context.

- PDP Activation / Session Establishment Acknowledgement: the SGSN has received an acknowledgement from the GGSN for that request.

10.2 Criteria for contact with the CSE

It shall be possible for the HPLMN to specify criteria that must be satisfied before the CSE is contacted. The following criteria may be defined:

10.2.1 CSI criteria applicable at attach, session establishment and session establishment acknowledgement procedure

CSI criteria may be defined for a subscriber both for the case where the GPRS subscriber attaches to the data network, for the case where she starts to set up a data session (PDP active) and for the case where acknowledgement of data session set-up is received (PDP activation acknowledgement).

Criterion at the attach procedure:

- Capabilities of GPRS MS class;

Criteria on the type of session (applicable at session establishment request and acknowledgement):

- Transfer characteristics; e.g. IP, X.25

- Service characteristics; e.g. Quality of Service

- Identities; e.g. Access Point Name

The criteria may be collectively defined to be either 'enabling trigger criteria' or 'inhibiting trigger criteria'. The HPLMN may choose not to define any criteria.

If:

- Enabling trigger criteria are met, or

- Inhibiting trigger criteria are not met, or

- No trigger criteria are defined

Then criteria permit the contact with the CSE to be established.

10.3 Attach procedure

The purpose of this procedure is to detect a request from a GPRS subscriber to attach to the data network and allow the CSE to modify the handling of the attach request.

If (according to the CSI) :

- the subscriber is provisioned with a CAMEL based service, relevant for GPRS data transmission; and

- the attach request is set as a trigger detection; and

- the attach request occurs; and

- criteria permit the contact with the CSE to be established.

then ,the VPLMN shall suspend attach processing, make contact with the CAMEL Service Environment and await further instructions.

The information listed in table: A-3 (Attach procedure) shall be provided to the CAMEL Service Environment, if available.

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

- activate other control service events for the period being attached to the data network. The CSE shall have the possibility to send the following information:

  - The service event which shall be detected and reported:

    - PDP activation/session establishment request;

    - PDP session establishment acknowledgement;

    - Change of position;

    - ~~Data volume threshold (including the type of threshold and when the threshold shall be reached);~~

    - ~~Attach duration threshold;~~

    - PDP deactivation;

    - Detach procedure;

- perform charging activities (amongst others defining a data or time threshold)

There shall be no restriction regarding 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:

- Reject the attachment request;

- allow the processing to continue unchanged.

10.4 PDP activation / Session Establishment

The purpose of this procedure is to manage a request from the subscriber to activate a Packet Data Protocol. If either (according to the CSI):

- the subscriber is provisioned with a CAMEL based service relevant for GPRS data transmission; and

  - the PDP activation request is set as a trigger detection; and

  - the PDP Activation request occurs; and

- criteria permit the contact with the CSE to be established,

or, the CSE has activated this service event for the attached subscriber and the PDP activation event occurs then,

- the VPLMN shall suspend processing, make contact with the CSE and await further instructions, or,

- send a notification and continue.

The information listed in table: A-3 (PDP activation / Session Establishment) shall be provided to the CSE if available.

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

- activate other control service events for the life of the PDP context. The CSE shall have the possibility to send the following information:

    - The service event which shall be detected and reported (including a session reference number):

        - Change of position

        - PDP session establishment acknowledgement

        - Data Packet Threshold Procedure (including the type of threshold and when the threshold shall be reached)

        - PDP deactivation procedure;

        - Detach procedure;

    - The type f monitoring.

    [Editor's note: Change of QoS is for further study.]

- Perform Charging Activities (amongst others defining a data or time threshold)

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 instruction:

- Release session,

- allow the processing to continue unchanged;

- allow the processing with modified information. The CSE shall have the possibility to send the following information:

    - Access Point Name.

10.5   PDP activation / Session Establishment Acknowledgement

The purpose of this procedure is to manage a request from the subscriber to activate a Packet Data Protocol. Note that mMultiple contacts to the CSE may be made in parallel due to PDP activation / session establishment acknowledgement events being detected whilst a GPRS subscriber is attached to the GSM network.

If either (according to the CSI) :

- the subscriber is provisioned with a CAMEL based service relevant for GPRS data transmission; and

- the PDP activation / session establishment acknowledgement is set as a trigger detection point; and

- the PDP Activation/Session Establishment Acknowledgement request occurs; and

- criteria permit the contact with the CSE to be established,

or the CSE has activated this service event for the attached and / or active subscriber and the PDP activation acknowledgement event occurs then,

- the VPLMN shall suspend processing, make contact with the CSE and await further instructions, or,

- send a notification and continue.

The information listed in table: A-3 (PDP activation / Session Establishment Acknowledgement) shall be provided to the CSE if available.

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

- activate other control service events for the life of the PDP context. The CSE shall have the possibility to send the following information:

  - The service event which shall be detected and reported (including a session reference number):

    - Change of position

    - ~~Data Packet Threshold Procedure (including the type of threshold and when the threshold shall be reached)~~

    - PDP deactivation procedure;

    - Detach procedure;

  ~~[Editor's note: Change of QoS is for further study.]~~

  - Perform Charging Activities (amongst others defining a data or time threshold)

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 instruction:

- Release session or PDP Context,

- allow the processing to continue unchanged;

10.6   Change of Position Procedure ~~(for further study)~~

The purpose of this procedure is to detect a request from the GPRS subscriber for update the actual routing area, i.e. to change from one SGSN to another SGSN.

If the CSE has activated this service event for the session and a request to change the position occurs, the VPLMN shall send a notification and continue.

The following information shall be provided to the CSE if available:

- Event met;

- New routing area;

10.7   Data Volume or Time ~~Packet~~ Threshold Procedure

The purpose of this procedure is to control the amount of data ~~transferred to and from~~transmitted by and transmitted to the served subscriber or the ~~granted~~used time per Session or PDP Context. The threshold is valid for one session or PDP Context of the subscriber only. If the subscriber controls simultaneous sessions, thresholds per session or PDP Context ~~has~~have to defined.

The type of threshold is indicated per session or PDP Context either as:

- ~~a number of packets or~~

- a ~~data volume transferred by or received by the subscriber~~
  maximum amount of data transmitted by and transmitted to the subscriber or

- a granted time to ~~transfer packets~~transmit data.

A threshold is reached within a session or PDP Context, when:

- ~~the number of packets reach the maximum number of granted packets,~~

- the total amount of ~~transmitted and received data~~ data transmitted by and transmitted to the subscriber reaches the granted data volume or,

- ~~when the time since allowed for data transmission is elapsed~~
  the allowed time for the Session or PDP Context has elapsed.

~~If the CSE has activated this service event for a session and a threshold is reached, the VPLMN shall suspend processing, buffer further packets, make contact with the CSE and await further instructions or send a notification and continue.~~

If the CSE has defined a threshold for a Session or PDP Context and the threshold has been reached, then the VPLMN shall inform the CSE.

The VPLMN shall not suspend the transmission of data packets to and from the GPRS terminal. The VPLMN shall immediately restart counting the amount of data ~~sent and received by~~ transmitted by and transmitted to the GPRS terminal or restart timing the duration of the Session or PDP Context.

The CSE may instruct the VPLMN to release the Session or PDP Context when the threshold is reached.

The following information shall be provided to the CSE, if available:

- ~~Event met;~~

- ~~The session for which the event is reported;~~

- ~~Type of monitoring.~~

- Charge result (elapsed time or total amount of data transmitted)

- The session or PDP Context for which the event is reported;

- Session or PDP Context-Active indicator

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

- ~~activate other control service events for the session. The CSE shall have the possibility to send the following information:~~

  - ~~The service event which shall be detected and reported (including a session reference number):~~

    - ~~Data Packet Threshold Procedure (including the type of threshold and when the threshold shall be reached)~~

    - ~~PDP deactivation~~

    - ~~Detach procedure~~

When the VPLMN has reported the reaching of the threshold to the CSE, the CSE shall be able to do the following (assuming the continuation of the applicable dialogue):

- perform charging activities (including the defining of a new threshold)

- ~~arm~~activate control service events. The CSE shall have the possibility to send the following information:

  - the Service event which shall be ~~detected and reported~~ reported (including a session or PDP Context reference number):

    - PDP deactivation

    - Detach Procedure

  - The session or PDP Context for which the event shall be monitored and reported

  - The type of monitoring (only monitor mode is allowed in this case)

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~~ it may send the following instruction:

~~- release session or PDP Context;~~

~~- perform charging activities;~~

~~- allow the processing to continue unchanged;~~

Once the CSE has concluded issuing the above instructions, it shall be able to act as follows (provided the session or PDP context has not been released):

- release the session or PDP Context

- allow the session or PDP Context to continue

10.8 PDP deactivation / Session Release

The purpose of this procedure is to detect a request from the subscriber to release a Packet Data Protocol.

If the CSE has activated this service event for the attached subscriber and the PDP deactivation event occurs then the VPLMN shall suspend processing, make contact with the CSE and await further instructions or send a notification and continue.

The following information shall be provided to the CSE:

- Event met;

- The session or PDP Context for which the event is reported;

- Type of monitoring;

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

- activate other control service events for the session. The CSE shall have the possibility to send the following information:

- the Service event which shall be detected and reported ~~reported~~:

    - Detach Procedure

    -the type of monitoring

- perform charging activities;

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 send the following instruction:

- allow the processing to continue unchanged;

10.9 Detach procedure

The purpose of this procedure is to detect a request from a GPRS subscriber to detach from the data network and to inform the CAMEL Service Environment on the request.

~~If the detach request occurs, then the VPLMN shall send a notification and continue.~~

If the CSE has activated this service event for the attached subscriber and the Detach event occurs, then the VPLMN shall suspend processing, make contact with the CSE and await further instructions or send a notification and continue.

The following information shall be provided to the CAMEL Service Environment, if available:

- Event met;

- Type of monitoring;

When the VPLMN has made contact with the CSE, the CSE shall be able to instruct the VPLMN 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 send the following instruction:

- allow the processing to continue unchanged;

10.10 CSE Initiated GPRS Detach Procedure

Following the CAMEL processing of the GPRS attach procedure or PDP context activation procedure it shall be possible for the CSE to initiate GPRS detach at any time.

~~To use this procedure the CSE shall previously have activated any service event (with "type of monitoring" set to control).~~
~~To use this procedure, there shall be at least one service event armed at that moment with monitoring type 'control', or the gprsSSF is in state Wait-for-Instruction.~~

To use this procedure, there shall be a control relationship between the CSE and the session.

10.11   CSE Initiated PDP Context Deactivation Procedure

Following the CAMEL processing of the PDP context activation procedure it shall be possible for the CSE to initiate PDP context deactivation at any time.

~~To use this procedure the CSE shall previously have activated any service event (with "type of monitoring" set to control).~~

~~To use this procedure, there shall be at least one service event armed at that moment with monitoring type 'control' or the gprsSSF is in state Wait-for-Instruction.~~

To use this procedure, there shall be a control relationship between the CSE and the PDP Context.

10.12   Change of Quality of Service Procedure

The CSE may request the VPLMN to report a change in Quality of Service (QoS).

When a QoS change occurs, then the VPLMN shall send a notification to the CSE and continue.

The following information shall be provided to the CSE:

- ~~Charging~~ Charge result – this may be ~~used~~ elapsed time or the total amount of data transmitted by and transmitted to the subscriber ~~or received~~

- Quality of Service

- PDP ID

- PDP Context state

When the CSE receives the notification of change of QoS, it may instruct the VPLMM to act as follows:

- perform charging activities (including the defining of a new threshold)

- arm control service events. The CSE shall have the possibility to send the following information:

    - the Service event which shall be detected and reported reported (including a session or PDP Context reference number):

        - PDP deactivation

        - Detach Procedure

    - The session or PDP Context for which the event shall be monitored and reported

    - The type of monitoring (only monitor mode is allowed in this case)

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 may send the following instruction:~~

    ~~release session or PDP Context;~~

Once the CSE has concluded issuing the above instructions, it shall be able to act as follows:

- release the session or PDP Context

- allow the session or PDP Context to continue

10.13   Charging Procedures

The CSE can perform the following charging activities:

10.13.1   Advice of Charge

The CSE may send Charge Advice Information (CAI) elements to the SGSN.

10.13.2   Inclusion of Free Format data in CDR

The CSE may send free format data to the SGSN, for inclusion in a CDR. The CSE shall specify the session or PDP Contex for which the free format data is destined.

When sending the free format data to the VPLMN, the CSE may instruct the VPLMN to

- overwrite the existing free format data for that session or PDP Context, or

- append the newly received free format data to the existing free format data

10.13.3 Specify a threshold for transmitted data or used time

See section 10.7.

10.13.4 Request notification of change in Quality of Service

The CSE may request the VPLMN to notify the CSE when a change in Quality of Service has occurred for a PDP Context.

3G CHANGE REQUEST

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

22.078 CR **018**   Current Version: 3.0.0

3G specification number ↑   *↑ CR number as allocated by 3G support team*

For submision to TSG   SA#?   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source:	S1	**Date:**	1999-09-27

Subject:	Short Message Submission Handling

3G Work item:	CAMEL phase 3

Category: F   Correction ☐

     A   Corresponds to a correction in a 2G specification ☐

(only one category   B   Addition of feature ☐

shall be marked   C   Functional modification of feature   **X**

with an X)   D   Editorial modification ☐

Reason for change:

This CR is due to the request from the GSM Association SERG via their liaison statement.

The VPLMN shall provide all the necessary SMS specific information to the CSE in order to allow the service logic a wider possibility to decide the handling of a short message.

'Originator of SM' is renamed to 'Data Coding Scheme' according to 3G TS 23.040 v3.1.0 in order to avoid confusion.

Clauses affected: 9.1

Other specs affected:

Other 3G core specifications	☐	→ List of CRs:
Other 2G core specifications	☐	→ List of CRs:
MS test specifications	☐	→ List of CRs:
BSS test specifications	☐	→ List of CRs:
O&M specifications	☐	→ List of CRs:

Other comments:

9 Procedures for SMS $(CAMEL3$)

9.1 Short message submission request procedure

The purpose of this procedure is to detect a SMS set-up request and allow the CSE to modify the handling of the SMS set-up request.

If (according to the CSI) :

- the subscriber is provisioned with a CAMEL based SMS originating service; and

- the SMS set-up request occurs;

Then the VPLMN shall suspend SMS processing, make contact with the CSE and await further instructions.

For mobile originated SMS the following information shall be provided to the CSE if available:

- Event met;

- IMSI;

- ~~Identity of the originator of the SM (SIM, ME, User);~~

- <u>Short Message handling information:</u>

    − <u>Validity Period Format</u>

    − <u>Status Report Request</u>

    − <u>User Data Header Indicator</u>

    − <u>Reply Path</u>

    − <u>Protocol Identifier</u>

    − <u>Data Coding Scheme</u>

    − <u>Validity Period;</u>

- SMSC address;

- Calling Party's Number;

- Service Key;

- Location information of the calling subscriber;

- time zone;

- Called Party Number.

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

- perform charging activities (inclusion in charging record of information received from the CSE);

- activate other control service events for the SM submission. The CSE shall have the possibility to send the following information:

    - The service event which shall be detected and reported:

- Unsuccessful SM submission.

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

- bar the SM submission;

- allow the submission to continue unchanged;

- allow the SMS processing with modified information. The CSE shall have the possibility to send the following information:

  - Called Party Number;

  - Calling Party's Number;

  - SMSC address.

In the case where the SM submission is barred, the served subscriber shall be informed.

CHANGE REQUEST No :   **019**

Technical Specification GSM   22.078   Version: 3.0.0

Submitted to SMG   #30   for approval   **X**   without presentation ("non-strategic")

for information   with presentation ("strategic")

Proposed change affects: SIM ☐   ME ☐   Network **X**

Work item: CAMEL phase 3

Source: Ericsson   **Date:**   27-09-1999

Subject: Removing the restriction on the total number of trigger criteria.

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

Reason for change: CAMEL Phase 3 specifies that the total number of numbers contained in the trigger criteria lists for subscribed dialled services at call setup (sect. 5.2.1.1) and number analysis (sect. 5.2.1.2) shall not exceed 10.

This restriction stems from limitations to transport and storage capabilities.

For implementation purposes, however, it is easier to have limitations only for the individual trigger criteria lists.

Therefore, the restriction on the total number of numbers shall be removed.

Clauses affected: 5.2.1.2

Other specs	Other releases of same spec		→ List of CRs:	
affected:	Other core specifications		→ List of CRs:	
	MS test specifications / TBRs		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	

5.2 Criteria for contact with the CSE $(CAMEL2$)

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

The following criteria may be defined:

5.2.1 CSI criteria applicable at call setup

5.2.1.1 CSI criteria applicable at call setup when dialled digits have been collected $(CAMEL2$)

CSI criteria may be defined for a subscriber for the case where collection of dialled digits has been performed $(CAMEL3$).

- Criteria on the dialled number; these consist of:

    - The contents of the dialled number (a list of up to 10 dialled number strings may be defined in the criteria. Each dialled number string may be in "unknown" or "international" format.);

    - The length of the dialled number (a list of up to three lengths may be defined.).

- The criteria on the dialled number may be collectively defined to be either "enabling" triggering criteria or "inhibiting" triggering criteria (see below). The HPLMN may also choose not to define any criteria on the dialled number.

- A criterion on the basic service: this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

- A criterion on the type of call: this consists of defining whether or not the call must be a forwarded call.

    A call is treated as forwarded in this respect when either a GSM forwarding supplementary service applies or when the call is forwarded as a result of a terminating CAMEL based service. The HPLMN may also choose not to define any criterion on the type of call.

If the criteria on dialled number are "enabling" then the dialled number criteria are satisfied if:

- the dialled number matches a dialled number string defined in the criteria; or

- the length of the dialled number matches a dialled number length defined in the criteria.

If the criteria on the dialled number are "inhibiting" then the dialled number criteria are satisfied if:

- the dialled number does not match any of the dialled number strings defined in the critera; and

- the length of the dialled number is not the same as any dialled number length defined in the criteria.

In these tests the dialled number matches one of the dialled number strings if:

- the two numbers are in the same format (unknown or international); and

- the dialled number is at least as long as the dialled number string in the criteria; and

- all the digits in the dialled number string in the criteria match the leading digits of the dialled number.

If no criterion on the dialled number is specified then the dialled number criteria are satisfied.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

The criterion on the type of call is satisfied if the type of the call is the same as the type defined in the criterion or if no call type criterion is specified.

The criteria on the call setup event procedure are satisfied if:

- the criteria on the dialled number are satisfied; and

- the criterion on the basic service is satisfied; and

-	the criterion on the type of call is satisfied.

### 5.2.1.2	CSI criterion applicable at call setup for subscribed dialled services $(CAMEL3S)

A CSI criterion on the contents of the called number shall be defined for subscribed dialled services. A list of up to 10 called number strings may be defined in the criterion. Each called number string may be in "unknown" or "international" format. Each entry in the called number list has associated with it a CSE identity and a service key which defines the service to be triggered if the criterion is satisfied.

~~The total number of entries in the dialled number list (5.1.A.1) and the called number list (5.1.A.2) shall not exceed 10.~~

The called number criterion is satisfied if the called number matches a called number string defined in the criterion.

In this test the called number matches one of the called number strings if:

-	the two numbers are in the same format (unknown or international); and

-	the called number is at least as long as the called number string in the criteria; and

-	all the digits in the called number string in the criteria match the leading digits of the called number.

### 5.2.1.3	CSI criterion applicable on detection of unsuccessful call establishment $(CAMEL3$)

A criterion on the release cause may be defined. This consists of a list of up to 5 cause values. The criterion on the release cause is satisfied if the received call release cause corresponds to any cause value defined in the list or if no criterion is defined.

CHANGE REQUEST No :   **020**

Technical Specification GSM   22.078   Version: 3.0.0

Submitted to SMG   #30   for approval   **X**   without presentation ("non-strategic")

for information | | with presentation ("strategic")

Proposed change affects: SIM | | ME | | Network **X**

Work item: CAMEL phase 3

Source: Ericsson   **Date:**   27-09-1999

Subject: Removing the 40-octet restriction of free format data

Category:

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

Reason for change: In CAMEL Phase 2, the amount of free format data that can be transported in the Furnish Charging Information operation (FCI) is restricted to 40 octets. This limit has been imposed due to the TAP2 specification, which limits the size of free format data in the CDR to 40 octets.

TAP3 has removed this limitation. In CAMEL Phase 3, the CSE should therefore be able to include more free format data in the CDR.

The limit of 40 octets shall therefore be removed.

Clauses affected: 15.2

Other specs	Other releases of same spec		→ List of CRs:
affected:	Other core specifications		→ List of CRs:
	MS test specifications / TBRs		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:	

15 Charging Activities $(CAMEL2$)

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

- calls may be divided into call periods for the purpose to control the call duration;

- the management and the control of a tariff switch which applies to subscriber charging is under the responsibility of the HPLMN. The time at which the tariff switches applies shall be the same for the control of e-values and for the control of the call duration;

- the tariff switch time is indicated to the network in form of a relative time to the reception of the instruction.

15.1 CSE controlled e-values

If the subscriber is provisioned with a CAMEL based service and if a contact exists between the IPLMN/VPLMN and the CSE, the CSE shall be able to send e-values for the Advice of Charge supplementary service.

For the purpose of charge indication on the MS even when one (or more) tariff switch occurs during the call, several sets of e-values may be sent by the CSE to the IPLMN/VPLMN and transmitted in sequence to the Mobile Station.

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 the call is answered;

- If two sets are sent, then:

    - a tariff switch time when the second set becomes valid must also be sent;

    - the first set of e-values is applicable from the beginning of the call except in the case where the tariff switch time occurs before the call is answered, then the second set of e-values is applicable at 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 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, if available.

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 maximum length of the information to be sent by the CSE and to be stored in the final call record is 40 bytes.~~

~~[Editors Note: A liaison statement has been sent to CAGE2+]~~

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 end of the call. The report shall contain call duration and release cause.

15.4　CSE control of call duration

The purpose of this procedure is to allow the CSE to monitor and influence the call duration.

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 time from the CSE;

   b) receive a switch time until the next tariff switch applies;

…

3G CHANGE REQUEST

22.078 CR **021**   Current Version: 3.0.0

For submision to TSG N2#9   for approval **X**

for information

Proposed change affects: USIM   ME   UTRAN   Core Network **X**

Source: Ericsson   **Date:** 27-09-1999

Subject: Defining Successful SM submission and Unsuccessful SM submission as EDP-N and EDP-R.

3G Work item: CAMEL phase 3

Category:
F   Correction

A   Corresponds to a correction in a 2G specification

B   Addition of feature

C   Functional modification of feature   **X**

D   Editorial modification

Reason for change:

The current CAMEL Phase 3, stage 1 specification, specifies that the successful and unsuccessful Short Message submission to the SMSC, may be armed as Service Events in *Notify mode* ('EDP-N') only.

The result is that the CSE can not adapt the charging information it includes in the CDR in the SGSN to the success or failure of the SM submission attempt.

In order to enable the CSE to deploy meaningful MO-SMS services, the CSE shall be

able to arm these Service Events in *Interrupt mode* ('EDP-R') as well.
This enables the CSE to perform charging activities at the end of Short Message submission, before the dialogue is terminated.

The CSE shall be able to include charging information in the CDR in the SGSN áfter it has been informed about the success or failure of the Short Message submission. Hereto, it shall be possible for the CSE to arm the successful and unsuccessful Short Message submission as EDP-R.

Clauses affected: 9.1, 9.A (new), 9.B (new)

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other 2G core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments: It has been agreed by SMG1 #5 (July 1999) that the CSE shall be able to arm the successful Short Message submission as a service event.

9   Procedures for SMS $(CAMEL3$)

9.1   Short message submission request procedure

The purpose of this procedure is to detect a SMS set-up request and allow the CSE to modify the handling of the SMS set-up request.

If (according to the CSI) :

- the subscriber is provisioned with a CAMEL based SMS originating service; and

- the SMS set-up request occurs;

Then the VPLMN shall suspend SMS processing, make contact with the CSE and await further instructions.

For mobile originated SMS the following information shall be provided to the CSE if available:

- Event met;

- IMSI;

- Identity of the originator of the SM (SIM, ME, User);

- SMSC address;

- Calling Party's Number;

- Service Key;

- Location information of the calling subscriber;

- time zone;

- Called Party Number.

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

- perform charging activities (inclusion in charging record of information received from the CSE);

- activate other control service events for the SM submission. The CSE shall have the possibility to send the following information:

  - The service event which shall be detected and reported:

    - Unsuccessful SM submission to the SMSC;

    - Successful SM submission to the SMSC.

  - The type of monitoring

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

- bar the SM submission;

- allow the submission to continue unchanged;

- allow the SMS processing with modified information. The CSE shall have the possibility to send the following information:

  - Called Party Number;

  - Calling Party's Number;

- SMSC address.

In the case where the SM submission is barred, the served subscriber shall be informed.

9.A Successful Short Message submission procedure

The purpose of this procedure is to detect the successful submission of a Short Message (SM) to the SMSC and to inform the CSE about it.

If the successful SM submission event occurs, then the VPLMN shall suspend processing, make contact with the CSE and await further instructions or send a notification and continue.

The following information shall be provided to the CSE, if available:

- Event met;

- Type of monitoring.

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

- perform charging activities.

Once the CSE has concluded performing charging activities, it shall issue the following instruction:

- allow the processing to continue.

9.B Unsuccessful Short Message submission procedure

The purpose of this procedure is to detect the unsuccessful submission of a Short Message (SM) to the SMSC and to inform the CSE about it.

If the unsuccessful SM submission event occurs, then the VPLMN shall suspend processing, make contact with the CSE and await further instructions or send a notification and continue.

The following information shall be provided to the CSE, if available:

- Event met;

- Type of monitoring.

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

- perform charging activities.

Once the CSE has concluded performing charging activities, it shall issue the following instruction:

- allow the processing to continue.

3G CHANGE REQUEST

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

22.078	**CR**	**022**		Current Version:	3.0.0

3G specification number ↑

↑ CR number as allocated by 3G support team

For submision to TSG

list TSG meeting no. here ↑

for approval **X**

for information

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

---

Proposed change affects:

USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source:	Nokia	**Date:**	21.9.1999

Subject:	CAMEL3 corrections to new Trigger Detection Points (TDP)

3G Work item:	CAMEL phase 3

Category:

	F	Correction	
	A	Corresponds to a correction in a 2G specification	
(only one category	B	Addition of feature	
shall be marked	C	Functional modification of feature	**X**
with an X)	D	Editorial modification	

Reason for change:

− Description of Route Select Failure was missing.

− Only RouteSelectFailure, T_Busy and T_No_Answer are TDPs in CAMEL3.

− It needs to be clarified how the new TDPs are threated when a dilogue has already been opened in DP2 or DP12.

– Conditional reporting of EDPs adds unnecessary complexity but nothing is gained. The driver for conditional TDPs is to save resources in the network. However, in conditional EDPs dialogue exists already, i.e. resources are taken. In addition if the EDPs were not always reported then dialogue may start hanging, and 3GPP TSG-CN2 is required to define new complex rules for dialogue termination and implicit disarming.

– The number of failure reason codes for MO and MT should be equal.

– "Cause" is a useful parameter in the InitialDP operation in the unsuccessful call cases. TSG-CN2 agreed this principle in September Abiko (Japan) meeting.

Clauses affected: 3, 5.1, 5.5, 6.1, 6.2.2, 6.3, Annex A.1

Other specs	Other 3G core specifications		→ List of CRs:
affected:	Other 2G core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments: This document is a result of S1-99599. The section 6.5 is not modified since Siemens tdoc S1-99279 and Nokia tdoc S1-99775 covers the issue.

3 Definitions and abbreviations

....

Route select failure: <u>A condition when routeing to the called party fails. Route Select Failure can be reported in an existing relationship $(CAMEL2$) or a new relationship can be initiated.</u>- $(CAMEL3$)

~~[test to be added]~~

Carrier Identification Code: Identifies uniquely the Carrier (NAEA). - $(CAMEL3$)

Carrier Selection Information: Is an indication whether the subscriber selected a carrier, or the carrier is predefined for the subscriber (NAEA). - $(CAMEL3$)

Originating Line Identification: Identifies uniquely the subscriber to be charged for the usage of the carrier (NAEA). - $(CAMEL3$)

Charge Number: Identifies uniquely the organisation to be charged for the usage of the carrier (NAEA). - $(CAMEL3$)

NAEA: North American Equal Access (NAEA). - $(CAMEL3$)

Subscribed Dialled Services: Identifies a set of maximum of ten service numbers. These service numbers are globally available to all HPLMN subscribers. No subscription is needed to access the service numbers within the HPLMN. Each service number is chosen on the HPLMN operators discretion. In the case of international roaming, the set of service numbers forms a part of the subscribers profile. - $(CAMEL3$)

5.1   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 - $(CAMEL3$);

- Detection of unsuccessful call establishment - $(CAMEL3$).
  Unsuccessful call establishment may be caused by:

  - called subscriber busy;

  - called subscriber not reachable;

  - no answer from called subscriber;

  - route select failure.

The definition of which of the above initial service events shall initiate contact with the CSE is part of the subscriber's CAMEL subscription information. ~~Only one of the above initial service event is indicated for each OSS.~~ Analysis of dialled digits can open a new dialogue regardless whether there exists a relationship or not. Upon detection of unsuccessful call establishment no new relationship is opened if there is already a dialogue open due to same CSI.

5.3   Call set-up request procedure

5.3.1   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 (according to the CSI):

-   the subscriber is provisioned with a CAMEL based originating service; and

-   the call set-up request occurs; and

-   the criteria are satisfied $(CAMEL2$).

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

For mobile originated calls the information listed in table: A-1 (Call set-up request procedure 1) shall be provided to the CSE if available.

For forwarded calls the information listed in table: A-1 (Call set-up request procedure 2) shall be provided to the CSE if available.

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

-   perform charging activities; $(CAMEL2$);

-   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:

        -   Called party connection;

        -   Call disconnection;

        -   Calling party abandon -$(CAMEL2$);

        -   Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer -$(CAMEL2$); ~~The CSE may specify the distinct unsuccessful case(s) for which the instruction is valid. $(CAMEL3$);~~

        -   Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

    -   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).

-   Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

-   Remove individual call parties from the call - $(CAMEL3$);

-   Connect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

-   order in-band user interaction. $(CAMEL2$).

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);

-   allow the call processing to continue unchanged;

-   allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Call set up request procedure 1).

5.5   Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an outgoing call set-up at the time when the call establishment is unsuccessful.

If no control relationship for the given call exists and

- the unsuccessful call establishment procedure is defined as initial service event (according to the CSI); and

- the call attempt is unsuccessful; and

- the triggering criteria are satisfied .

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

If a relationship for the given call already exists and the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the VPLMN 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

If the unsuccessful call procedure is armed as a initial service event, the information listed in table: A-1 (Unsuccessful call establishment (MO)) shall be provided to the CSE additionally if available. A new relationship is opened only if triggering criteria are fulfilled and no relationship exists already for the same CSI- $(CAMEL3$)

When the 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 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:

    - Called party connection;

    - Call disconnection;

    - Calling party abandon;

    - Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer;

    - Mid call event (DTMF) $(CAMEL3$);

  - 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).

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Put call parties on hold - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- 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. The CSE shall have the possibility to send the following information listed in table: A-2 (Unsuccessful call establishment (MO)).

- release call

6.1 Initial service events

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

- Authorisation attempt

- Detection of unsuccessful call establishment.

    Unsuccessful call establishment may be caused by:

    - called subscriber busy;

    - called subscriber not reachable;

    - no answer from called subscriber.

Upon detection of unsuccessful call establishment no new relationship is opened if there is already a dialogue opened due to same CSI.

6.2   Criteria for contact with the CSE $(CAMEL2$)

6.2.1   CSI criteria applicable on terminating attempt authorisation

It shall be possible for the HPLMN to specify a criterion which must be satisfied before the CSE is contacted.

The following criterion may be defined:

-   A criterion on the basic service; this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

On the incoming call request event procedure the CSE shall be contacted if the criterion on the basic service is satisfied.

6.2.2   CSI criterion applicable on detection of unsuccessful call establishment $(CAMEL3$)

A criterion on the failure reason may be defined. This consists of a list of up to 6̶5 failure reasons. A failure reason can denote a release cause value or can denote that the HPLMN determined that the called subscriber was not reachable. The criterion on the failure reason is satisfied if the reason for failure of the call corresponds to any failure reason defined in the list or if no criterion is defined.

6.3   Incoming call request procedure

The purpose of this procedure is to detect an incoming call request and allow the CSE to modify the handling of the incoming call.

If (according to the CSI):

-   the subscriber is provisioned with a CAMEL based terminating service; and

-   the incoming call request event occurs

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

For mobile terminated calls the following information listed in table: A-1 (Incoming call request procedure) shall be provided to the CSE if available.

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

-   perform charging activities; -$(CAMEL2$)

-   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:

        -   Called party connection;

        -   Call disconnection;

        -   Calling party abandon -$(CAMEL2$);

        -   Unsuccessful call establishment. In case of no answer the CSE may provide a no answer timer $(CAMEL2$). ~~The CSE may specify the distinct unsuccessful case(s) for which the instruction is valid. $(CAMEL3$);~~

        -   Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid. $(CAMEL3$);

    -   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).

$(begin$(CAMEL3$)-   activate control service events for the originating call leg. The CSE shall have the possibility to send the following information: :

    -   The service event which shall be detected and reported:

        -   Called party connection;

        -   Call disconnection;

        -   Calling party abandon;

        -   Unsuccessful call establishment. The CSE may specify the distinct unsuccessful case(s) for which the instruction is valid.;

        -   Mid call event (DTMF). The CSE shall specify the digit string(s) for which the instruction is valid.

    -   The party in the call for which the event shall be detected and reported (calling or called party);

$(end$(CAMEL3$)

-   suppress tones and announcements which may be played to the calling party, if an unsuccessful call establishment occurs.

$(begin$(CAMEL1$)

This is only applicable when the called party number is unchanged by the CSE.

$(end$(CAMEL1$)

- Create additional parties in the call (refer to Section 'Creation of called parties') - $(CAMEL3$);

- Remove individual call parties from the call - $(CAMEL3$);

- Reconnect an individual call party or a group of call parties to another call party or group of call parties, within the same call - $(CAMEL3$);

- order in-band user interaction.$(CAMEL2$)

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);

- allow the call processing to continue unchanged;

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Incoming call request procedure).

In the case the CSE instructs the IPLMN to allow the call processing with a changed called party number, the CSE shall indicate whether the resulting call shall be treated by the IPLMN as a forwarded call or not. Any forwarded call resulting from a CSE Call Forwarding service may cause an invocation of any mobile originated CAMEL based service in the IPLMN.

$(begin$(CAMEL2$)

In the case the CSE instructs the IPLMN to allow the call processing with modified information, the CSE may send to the IPLMN an alerting pattern in order to alert the called subscriber in a specific manner. This alerting pattern shall be transferred to the VPLMN.

$(end$(CAMEL2$)

Annex A (normative):
Information Tables

A.1 Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various events. The numbers are reflecting the applicable Camel phase (!, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Call set-up request procedure 3	Call set-up request procedure 4	Unsuccessful call establishment (MO)	Unsuccessful call establishment (MT)	Incoming call request procedure	Procedures for serving network dialled services	Procedures for serving ...
Event met	1	1	3	3	3	3	1	3	3
IMSI	1	1	3	3	3	3	1	3	3
Calling Party's Number	1	1	3	3	3	3	1	3	3
Calling Party's Category	1	1	3	3	-	3	1	3	3
Additional Calling Party Number	-	1	-	3	-	3	1	-	3
Called Party BCD Number	1	-	3	-	3	-	-	3	-
Called Party Number	-	1	-	3	-	3	1	-	3
Original Called Party Number	-	1	-	3	-	3	1	-	3
Redirecting (Party) Number ????	-	1	-	3	-	3	1	-	3
Redirection Information	-	1	-	3	-	3	1	-	3
Service Key	1	1	3	3	3	3	1	3	3
ISDN Bearer Capability	1	1	3	3	3	3	1	3	3
High Layer Compatibility	1	1	3	3	3	3	1	3	3
Basic Service Code	1	1	3	3	3	3	1	3	3
Call Identification Information	1	1	3	3	3	-	-	?	?
Location Information of the Calling Subscriber	1	-	3	-	3	-	-	3	-
Location Number of the Calling Subscriber	-	-	-	-	-	3	1	-	-
Location information of the called subscriber	-	-	-	-	-	3	1	-	-
Subscriber State of the called subscriber	-	-	-	-	-	3	1	-	-
Cause - $(CAMEL3$)	-	-	-	-	3	3	-	-	-
Time and Time Zone Information - $(CAMEL2$)	2	2	3	3	3	3	2	?	?
Optimal Routing Indication - $(CAMEL3$)	-	-	?	?	-	-	-	3	3
Calling Party LSA (if available) $(CAMEL3$)	3	-	3	-	-	-	-	3	-
IMEI -$(CAMEL3$)	3	-	3	-	3	-	-	?	-
Terminal characteristics and capabilities (see MExE, 02.57) - $(CAMEL3$)	3	-	3	-	3	-	-	?	-
MExE classmark (see MExE, 02.57) -$(CAMEL3$)	3	-	3	-	3	-	-	?	-
NAEA Carrier Identification Code (CIC) -$(CAMEL3$)	3	3	3	3	3	3	3	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) -$(CAMEL3$)	3	3	3	3	3	3	3	3	3
NAEA Originating Line Identification (OLI) - $(CAMEL3$)	-	3	-	3	-	-	-	-	3
NAEA Charge Number (CN) - $(CAMEL3$)	-	3	-	3	-	-	-	-	3

Table A-1: Information transferred towards the CSE

[CR editor's note: S1 tdoc S1-99674 has no column for MT unsuccessful case. However, it indicates that some elements are supported in CAMEL ph 2 for unsuccessful cases. This fact needs clarification in future meetings.]

	CHANGE REQUEST No :	**023**	

Technical Specification GSM   22.078   Version: 3.0.0

Submitted to SMG   #30   for approval   **X**   without presentation ("non-strategic")

for information   with presentation ("strategic")

Proposed change affects: SIM ☐   ME ☐   Network **X**

Work item: CAMEL phase 3

Source: Ericsson   **Date:**   28-09-1999

Subject: Description of CAMEL Subscription Information

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

Reason for change: The present CR introduces a section in the CAMEL Phase 3, stage 1 specification, that gives an overview of the various CAMEL Subscription Informations.

Clauses affected: 4.1

Other specs	Other releases of same spec	☐	→ List of CRs:	
affected:	Other core specifications	☐	→ List of CRs:	
	MS test specifications / TBRs	☐	→ List of CRs:	

	BSS test specifications		□	→ List of CRs:	
	O&M specifications		□	→ List of CRs:	

Other comments:

	BSS test specifications			→ List of CRs:
	O&M specifications			→ List of CRs:

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

~~The CAMEL Subscription Information (CSI) is provided by the HPLMN operator by administrative means.~~

~~The CSI may include the Translation Information Flag (TIF-CSI). If present for a subscriber the network will apply special handling of the call forwarding supplementary service. For details refer to section 12.3 $(CAMEL2$).~~

~~The Network CAMEL Service Information (N-CSI) for network-based services is provided by the serving PLMN operator. The provisioning mechanism is out of the scope of this specification. $(CAMEL3$).~~

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 CSI's may be adminstered per subscriber:

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

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

TV-CSI $(CAMEL3$) *Terminating VMSC CAMEL Subscription Information (TV-CSI)* is transferred to the VPLMN at location update. TV-CSI contains trigger information that is required to invoke a CAMEL Service Logic for Mobile Terminating calls in the VMSC.
See section 6 for the usage of TV-CSI.

SS-CSI $(CAMEL2$) *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.

TIF-CSI $(CAMEL2$) *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 (FTN's). When TIF-CSI is present, the subscriber is allowed to register short FTN's.
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 $(CAMEL2$) *USSD CAMEL Subscription Information (U-CSI)* is held in the HLR; it is not sent to any other node. U-CSI contains trigger information that 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 $(CAMEL2$) *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 that is used to invoke a USSD application in the CSE for all subscribers.
See section 14.3 for the usage of UG-CSI.

SMS-CSI $(CAMEL3$) *Short Message Service CAMEL Subscription Information (SMS-CSI)* is transferred to the VPLMN. 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 SMS-CSI.

GPRS-CSI $(CAMEL3$) *GPRS CAMEL Subscription Information (GPRS-CSI)* is transferred to the VPLMN. GPRS-CSI contains trigger information that is required to invoke a CAMEL Service Logic for Originating GPRS Sessions and PDP Contexts.
See section 10 for the usage of GPRS-CSI.

M-CSI $(CAMEL3$) *Mobility Management CAMEL Subscription Information (M-CSI)* is transferred to the VPLMN. M-CSI is used to notify the CSE about Mobility Management events.
See section 12.1 for the usage of M-CSI.

Refer to 3G TS 23.078 for detailed descriptions of the various CAMEL Subscription Informations.

4.2 General Procedures

Each GSM 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE, isare defined in the CAMEL Subscription 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; or - $(CAMEL3$);

- the CSE creates a call - $(CAMEL3$).

In addition dialled services may be applicable in a PLMN if the N-CSI is active in the PLMN. -$(CAMEL3$)

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

- Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

- Order in band user interaction -$(CAMEL2$);

- Create additional parties in the call - $(CAMEL3$);

- Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

- Continue the processing of the call, or;

- Connect the calling party to a specified called party;

After one of the above instructions, the relation between the serving network and the CSE shall be released.

It should be possible in the case of serving network-based services to:

- Continue the processing of the call, or;

- Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- MT call;

- MO call (forwarded calls are treated as MO calls);

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service $(CAMEL3$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

4.3   Applicability of CAMEL to Basic Services

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

CAMEL procedures are applicable to GPRS session $(CAMEL3$).

3G CHANGE REQUEST

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

22.078	**CR**	**024**		Current Version:	3.0.0

3G specification number ↑   ↑ *CR number as allocated by 3G support team*

For submission to TSG   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source:	Nokia	**Date:**	28.9.1999

Subject:	CAMEL3 corrections and clarifications to dialled services (subscribed & serving network)

3G Work item:	CAMEL phase 3

Category: F   Correction   **X**

(only one category   A   Corresponds to a correction in a 2G specification   ☐

shall be marked   B   Addition of feature   ☐

with an X)   C   Functional modification of feature   ☐

    D   Editorial modification   ☐

Reason for change:

− It shall be clarified how dialled services initiate a new dialogue to CSE.

− Interworking of dialled services and creation of called parties must be clarified – Dialled services are not applicable to the legs created by the SCP/CSE.

− Because multiple dialogues to possibly different CSEs exist in one call it must be clarified

which number is compared to the triggering criterion of dialled services.

Clauses affected: 5.10, 7, 7.2, Annex A.1

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other 2G core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

5.10   Creation of called parties $(CAMEL3$)

The purpose of this procedure is to allow the CSE to initiate the creation of called parties in the call as long as a controlling relation to the CSE exists.

The CSE shall send a request to initiate a call attempt. In this case the CSE shall always arm all events pertaining to unsuccessful call connection and to answer, and then continue processing of the call attempt before any other activities are performed on the call party created.

The information that it shall be possible to receive in the initiate call attempt request is listed in table: A-2 (Creation of called parties).

Upon receipt of an answer or unsuccessful call establishment event then the event is reported to the CSE.

The following information shall be provided to the CSE:

- Event met;

- The party in the call for which the event is reported (only a Called party is applicable);

- Type of monitoring.

Processing then continues as defined in the following Sections:

- 5.3.1,

- 5.4,

- 5.5,

- ~~5.B,~~

- 5.6, ~~and~~

- ~~5.7.~~

- 5.9,

- 6.3,

- 6.4,

- 6.5,

- 6.6,

- 6.8, and

- 6.9

7   Procedures for serving network dialled services $(CAMEL3$)

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 dialled services information and allow the CSE to modify the handling of the call set-up request. If this procedure is triggered it shall happen after processing of Subscribed Dialled Services triggered via the CSI. If any other CAMEL dialogue has changed called party number then the modified called party number is compared to triggering criteria.

Annex A (normative):
Information Tables

A.1   Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various events. The numbers are reflecting the applicable Camel phase (!, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Call set-up request procedure 3	Call set-up request procedure 4	Unsuccessful call establishment	Incoming call request procedure	Procedures for serving network dialled services	Procedures for serving network dialled services
Event met	1	1	3	3	3	1	3	3
IMSI	1	1	3	3	3	1	3	3
Calling Party's Number	1	1	3	3	3	1	3	3
Calling Party's Category	1	1	3	3	-	1	3	3
Additional Calling Party Number	-	1	-	3	-	1	-	3
Called Party BCD Number	1	-	3	-	3	-	3	-
Called Party Number	-	1	-	3	-	1	-	3
Original Called Party Number	-	1	-	3*1	-	1	-	3*1
Redirecting (Party) Number ????	-	1	-	3	-	1	-	3
Redirection Information	-	1	-	3	-	1	-	3
Service Key	1	1	3	3	3	1	3	3
ISDN Bearer Capability	1	1	3	3	3	1	3	3
High Layer Compatibility	1	1	3	3	3	1	3	3
Basic Service Code	1	1	3	3	3	1	3	3
Call Identification Information	1	1	3	3	3	-	?	?
Location Information of the Calling Subscriber	1	-	3	-	3	-	3	-
Location Number of the Calling Subscriber	-	-	-	-	-	1	-	-
Location information of the called subscriber	-	-	-	-	-	1	-	-
Subscriber State of the called subscriber	-	-	-	-	-	1	-	-
Time and Time Zone Information - $(CAMEL2$)	2	2	3	3	3	2	?	?
Optimal Routing Indication - $(CAMEL3$)	-	-	?	?	-	-	3	3
Calling Party LSA (if available) $(CAMEL3$)	3	-	3	-	-	-	3	-
IMEI -$(CAMEL3$)	3	-	3	-	3	-	?	-
Terminal characteristics and capabilities (see MExE, 02.57) - $(CAMEL3$)	3	-	3	-	3	-	?	-
MExE classmark (see MExE, 02.57) -$(CAMEL3$)	3	-	3	-	3	-	?	-
NAEA Carrier Identification Code (CIC) -$(CAMEL3$)	3	3	3	3	3	3	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) -$(CAMEL3$)	3	3	3	3	3	3	3	3
NAEA Originating Line Identification (OLI) - $(CAMEL3$)	-	3	-	3	-	-	-	3
NAEA Charge Number (CN) - $(CAMEL3$)	-	3	-	3	-	-	-	3

Table A-1: Information transferred towards the CSE

*1: If any other CAMEL dialogue has modified called party number then the modified number is reported to the CSE of dialled services.

<table>
<tr><td colspan="3"></td></tr>
</table>

3G CHANGE REQUEST

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

22.078	**CR**	**025**	Current Version:	3.0.0

3G specification number ↑   *↑ CR number as allocated by 3G support team*

For submision to TSG   N2#9   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM [ ]   ME [ ]   UTRAN [ ]   Core Network [**X**]

(at least one should be marked with an X)

Source:	Ericsson	**Date:**	27-09-1999

Subject:	Charging clarifications for MO-SMS

3G Work item:	CAMEL phase 3

Category: F   Correction   [ ]

                A   Corresponds to a correction in a 2G specification   [ ]

(only one category   B   Addition of feature   [ ]

shall be marked   C   Functional modification of feature   [ ]

with an X)   D   Editorial modification   [**X**]

Reason for change: The CSE shall have the possibility to include charging data in a CDR in the VPLMN for MO-SMS.

When doing so, the CSE may instruct the VPLMN to

- overwrite the existing data in the CDR with the newly received free format data or

- to append the newly received free format data to the existing data in the CDR.

This capability shall be properly specified.

Clauses affected: 9.1, 9.A (new)

Other specs	Other 3G core specifications		→ List of CRs:	
affected:	Other 2G core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

9   Procedures for SMS $(CAMEL3$)

9.1   Short message submission request procedure

The purpose of this procedure is to detect a SMS set-up request and allow the CSE to modify the handling of the SMS set-up request.

If (according to the CSI) :

-   the subscriber is provisioned with a CAMEL based SMS originating service; and

-   the SMS set-up request occurs;

Then the VPLMN shall suspend SMS processing, make contact with the CSE and await further instructions.

For mobile originated SMS the following information shall be provided to the CSE if available:

-   Event met;

-   IMSI;

-   Identity of the originator of the SM (SIM, ME, User);

-   SMSC address;

-   Calling Party's Number;

-   Service Key;

-   Location information of the calling subscriber;

-   time zone;

-   Called Party Number.

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

-   perform charging activities ~~(inclusion in charging record of information received from the CSE);~~

-   activate other control service events for the SM submission. The CSE shall have the possibility to send the following information:

    -   The service event which shall be detected and reported:

        -   Unsuccessful SM submission

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

-   bar the SM submission;

-   allow the submission to continue unchanged;

-   allow the SMS ~~processing~~ submission with modified information. The CSE shall have the possibility to send the following information:

    -   Called Party Number;

    -   Calling Party's Number;

    -   SMSC address.

In the case where the SM submission is barred, the served subscriber shall be informed.

9.A   Charging Procedures

9.A.1   Inclusion of Free Format data in CDR

The CSE may send free format data to the VPLMN, for inclusion in a CDR.

When sending the free format data to the VPLMN, the CSE may instruct the VPLMN to

- overwrite the existing data in the CDR with the newly received free format data or

- append the newly received free format data to the existing data in the CDR.

3G CHANGE REQUEST

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

22.078 CR **026**   Current Version: 3.0.0

3G specification number ↑   *↑ CR number as allocated by 3G support team*

HFor submision to TSG   for approval   **X**   *(only one box should*

list TSG meeting no. here ↑   for information   ☐   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM ☐   ME ☐   UTRAN ☐   Core Network **X**

(at least one should be marked with an X)

Source:	Nokia	**Date:**	21.9.1999

Subject: CAMEL3 Call Forwarding and new TDP interworking

3G Work item: CAMEL phase 3

Category: F   Correction   ☐

            A   Corresponds to a correction in a 2G specification   ☐

(only one category   B   Addition of feature   **X**

shall be marked   C   Functional modification of feature   ☐

with an X)   D   Editorial modification   ☐

Reason for change: In CAMEL phase 2 call forwarding (CF) is notified to CSE/SCP as an Event Detection Point (EDP) prior to CF invocation. Since CAMEL phase introduces new Trigger Detection Points (TDPs) the interworking must be clarified. The proposed functionality in short:

−   If CAP dialogue exists already, CF is reported as an EDP, if EDP is armed. This is already

in CAMEL phase 2.

- If no CAP dielogue exists then a new dialogues is established by sending InitialDP to CSE.

- In order to send InitialDP operation the triggering criteria must be fulfilled. In order to check triggering criteria reason code is derived from the call forwarding reason.

Clauses affected: 6.5, 18.3.2, 18.3.3, 18.3.4

Other specs	Other 3G core specifications		→ List of CRs:	
affected:	Other 2G core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

6.5   Unsuccessful call establishment $(CAMEL2$)

The purpose of this procedure is to manage an incoming call set-up at the time when the call establishment is unsuccessful.

[CR editor's note: The Italic text above is from Siemens contribution S1-99279. The difference compared to that CR is marked with change bar(s). All other modifications of tdoc 279 shall be incorporated as proposed by Siemens.]

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

- *the unsuccessful call establishment procedure is defined as initial service event (according to the CSI); and*

- *the call attempt is unsuccessful; and*

- *the triggering criteria are satisfied ,*

then the VPLMN/IPLMN shall suspend call processing, make contact with the CSE and await further instructions.

If a relationship for the given call already exists and the CSE has activated this service event for this call and the unsuccessful call establishment event occurs the VPLMN/IPLMN shall:

18.3.1   Call Forwarding Unconditional (CFU)

The Call Forwarding Unconditional service will be invoked after any terminating CAMEL based service. Any forwarded call resulting from a GSM Call Forwarding supplementary service may cause invocation of any mobile originated CAMEL based services.

$(begin$(CAMEL3$)

The CSE shall be able to instruct the forwarding PLMN to suppress the normal handling of Call Forwarding Unconditional and replace it by one or other of the following:

- If Call Forwarding Unconditional is active and operative for the call being processed, the call shall fail, with a reason of Forwarding Violation;

- The call shall be handled as if Call Forwarding Unconditional was not active and operative.

$(end$(CAMEL3$)

18.3.2   Call Forwarding on Busy (CFB)

As for Call Forwarding Unconditional (see subclause 4218.3.1).

$(begin$(CAMEL3$)

The CSE shall be able to instruct the forwarding PLMN to suppress the normal handling of Call Forwarding on Busy and to handle the call as if Call Forwarding on Busy was not active and operative.

If no terminating CAMEL service is active then a new relationship is opened to the CSE prior to CF invocation. In order to open new relationship the failure reason criterion shall be checked. In order to check triggering criteria the forwarding PLMN shall derive reason code from call forwarding reason; this derived reason code is compared to the triggering criteria.

$(end$(CAMEL3$)

18.3.3   Call Forwarding on No Reply (CFNRy)

As for Call Forwarding on Busy (see subclause 4218.3.1).

18.3.4   Call Forwarding on Not Reachable (CFNRc)

As for Call Forwarding on Busy (see subclause 4218.3.1).

3GPP TSG-S1

3GPP Tdoc S1-99776

Munich, Germany

Agenda 6.2.2

05 - 09 July 1999

CHANGE REQUEST No :   **027**   *Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM   22.078   Version: 3.0.0

Submitted to SMG   30   for approval   **X**   without presentation ("non-strategic")

list SMG plenary meeting no. here ↑   for information   with presentation ("strategic")   **X**

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

---

Proposed change affects: SIM ☐   ME ☐   Network **X**

(at least one should be marked with an X)

Work item: CAMEL Phase 3

Source: Vodafone   **Date:**   29 Sept 1999

Subject: Support For MSP Phase 2

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

Reason for change: MSP phase 1 supports provision of a number of supplementary services on a "per subscriber" basis. MSP phase 2 will enable provision of supplementary services to be on a "per profile" basis. To enable this some additional CAMEL interactions are required.

Clauses affected:

Other specs	Other releases of same spec		→ List of CRs:
affected:	Other core specifications		→ List of CRs:
	MS test specifications / TBRs		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:

help.doc

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

18 Interactions with supplementary services

18.1 General

This subclause defines the interaction between GSM supplementary services and the CAMEL feature. However, it should be noted that the most effective way to control those service interactions is through managing the provisioning of services. Where possible, subscribers provisioned with services using the CAMEL feature shall not be provisioned with GSM services having an adverse interaction with the CAMEL based services. GSM supplementary services shall not have any knowledge of CAMEL based services.

In general, call independent supplementary service operations (registration, erasure, activation, deactivation and interrogation) are not modified by CAMEL. The exceptions to this for CAMEL phase 2 are the call forwarding services, described in subclause 12.3.1.

18.2 Line Identification

18.2.1 Calling Line Identification Presentation (CLIP)

The CSE shall be able to create or modify an additional calling line identity (additional calling party number) which is presented to the called subscriber via the CLIP supplementary service. There shall be no restriction to the format of the additional calling line identity determined by the CSE.

The CSE shall not be able to modify the calling line identity (calling party number).

18.2.2 Calling Line Identification Restriction (CLIR)

No interaction. The CSE is not able to change the presentation indicator given to the called subscriber via the CLIP supplementary service.

18.2.3 Connected Line Identification Presentation (COLP)

No interaction. The CSE is not able to change the connected line identity.

18.2.4 Connected Line Identification Restriction (COLR)

No interaction. The CSE is not able to change the presentation indicator given to the calling subscriber via the COLP supplementary service.

18.3 Call Forwarding

$(begin$(CAMEL2$)

For the registration of call forwarding supplementary services the network shall accept any forwarded to number for a subscriber provided with a TIF-CSI. In this case the HPLMN shall treat the forwarded-to number transparently at the time of registration, i.e. it shall not perform validity checks or translations of the format of the number. The forwarding PLMN shall treat the forwarded-to number transparently when the call forwarding service is invoked. The CSE may modify the forwarded-to number within the MO CAMEL Service provided for the subscriber when the call forwarding service is invoked.

> NOTE: Network operators should ensure that the TIF-CSI is provided only to subscribers who are provided with an MO CAMEL service which is capable of translating the registered forwarded-to number.

If the forwarding PLMN does not support CAMEL phase 2, the HPLMN shall consider the call forwarding service as not registered if the forwarded-to number is not stored in international format.

> NOTE: If the served subscriber requires invocation of call forwarding services even when the forwarding PLMN does not support CAMEL phase 2, she has to register a forwarded-to number in E.164 international format.

NOTE: Network operators should be aware that unpredictable service behaviour could be experienced if the detection points for 'Busy', 'Not Reachable' or 'No Answer' are armed when the corresponding 'conditional' GSM call forwarding supplementary service is active.

$(end$(CAMEL2$)

18.3.1   Call Forwarding Unconditional (CFU)

The Call Forwarding Unconditional service will be invoked after any terminating CAMEL based service. Any forwarded call resulting from a GSM Call Forwarding supplementary service may cause invocation of any mobile originated CAMEL based services.

$(begin$(CAMEL3$)

The CSE shall be able to instruct the forwarding PLMN to suppress the normal handling of Call Forwarding Unconditional and replace it by one or other of the following:

-   If Call Forwarding Unconditional is active and operative for the call being processed, the call shall fail, with a reason of Forwarding Violation;

-   The call shall be handled as if Call Forwarding Unconditional was not active and operative.

$(end$(CAMEL3$)

18.3.2   Call Forwarding on Busy (CFB)

As for Call Forwarding Unconditional (see subclause 12.3.1).

$(begin$(CAMEL3$)

The CSE shall be able to instruct the forwarding PLMN to suppress the normal handling of Call Forwarding on Busy and to handle the call as if Call Forwarding on Busy was not active and operative.

$(end$(CAMEL3$)

18.3.3   Call Forwarding on No Reply (CFNRy)

As for Call Forwarding on Busy (see subclause 12.3.1).

18.3.4   Call Forwarding on Not Reachable (CFNRc)

As for Call Forwarding on Busy (see subclause 12.3.1).

18.4   Call Completion

18.4.1   Call Hold (CH)

~~No interaction.~~ For both originating and terminating calls, the Call Hold service is invoked after the CAMEL feature is invoked. When a call is established the CSE shall instruct the VPLMN of the served subscriber whether Call Hold is possible. A call created when a call has been put on hold may be subject to the CAMEL feature in the same way as a normal mobile originating call.

18.4.2   Call Waiting (CW)

~~No interaction.~~ Incoming, waiting calls are treated by the CSE as any other mobile terminating calls which encounter an idle subscriber. When a call is established the CSE shall instruct the VPLMN of the served subscriber whether Call ~~w~~Waiting is possible.

18.5 Multi Party (MPTY)

~~No interaction.~~ A multi party call may include one or more call~~s~~ legs subject to CAMEL based services. If a call leg is subject to CAMEL based services the CSE shall be able to instruct the VPLMN of the served subscriber whether that leg may be included in a multi party call.

18.6 Closed User Group (CUG)

~~The Closed User Group supplementary service shall be invoked before any originating or terminating CAMEL based service.~~ The CSE shall decide whether to invoke the CUG supplementary service and shall perform the necessary processing for a Mobile Originated, Mobile Terminated or Forwarded call.

~~The CSE shall decide whether to invoke the CUG supplementary service and shall perform the necessary processing for a Mobile Terminated call.~~ When a terminating call with CUG information is received for a CAMEL marked subscriber and if the terminating CAMEL based service attempts to modify the called party number:

- the IPLMN shall release the call towards the calling party when the called subscriber subscribes to CUG;

- the IPLMN shall continue the call establishment towards the modified called party number when the called subscriber does not subscribe to CUG.

18.7 Advice of Charge (AoC)

Advice of Charge is not guaranteed to operate correctly for calls subject to CAMEL phase 1 based services. It is recommended that subscribers are not provisioned with Advice of Charge and any CAMEL based service for which there is an adverse interaction.

$(begin$(CAMEL2$)

If CAMEL phase 2 is supported and the phase 2 charging function "CSE controlled e-values" is used, the VPLMN shall use the received e-values from the CSE for the purpose of the AoC supplementary service. Once the VPLMN has received e-values from the CSE, only CSE provided e-values are applicable for this call. The e-values shall only be sent by the VPLMN to the MS if the served subscriber is provided with the AoC supplementary service according to GSM 02.86.

$(end$(CAMEL2$)

18.8 Call Barring

$(begin$(CAMEL2$)

NOTE: CAMEL may be used to establish forwarded-legs and CAMEL based re-routing-legs that violate conditional GSM outgoing call barring and ODB services. Network operators should take care to avoid problems that may arise because of this interaction.

$(end$(CAMEL2$)

18.8.1 Barring of all outgoing calls

18.8.1.A Mobile originated calls

No interaction. The Barring of all outgoing calls supplementary service will be invoked. Thus, originating CAMEL based services will not be invoked.

18.8.1.B Forwarded Calls

No interaction. If the Barring of all outgoing calls supplementary service is active and operative, it shall prevent the registration or activation of Call Forwarding as specified in GSM 02.82.

[Editor's note: this may be GSM 02.88 - needs checking]

18.8.2 Barring of outgoing international calls

18.8.2.1 Mobile originated calls

No interaction. Any originating CAMEL based services shall be invoked before the Barring of outgoing international calls supplementary service.

$(begin$(CAMEL3$)

The CSE shall be able to instruct the originating VPLMN to suppress the invocation of Barring of outgoing international calls and to handle the call as if Barring of outgoing international calls was not active and operative.

$(end$(CAMEL3$)

18.8.2.2 Forwarded Calls

No interaction. The interaction between call forwarding and call barring is not be modified by CAMEL. This means that the interaction is applied prior to the invocation of call forwarding. When call forwarding is invoked (possibly with originating CAMEL services in the forwarding leg) then the VPLMN or IPLMN shall not apply outgoing call barring services.

$(begin$(CAMEL2$)

If the served subscriber is provided with a TIF-CSI the network shall not perform the interaction of call forwarding services with this barring program, i.e.

- the registration request is accepted even if this barring program is active and operative;

- the activation of this barring program is accepted even if a call forwarding supplementary service is active.

When call forwarding is invoked(possibly with originating CAMEL services in the forwarding leg) the VPLMN or IPLMN shall not invoke outgoing call barring services.

$(end$(CAMEL2$)

$(begin$(CAMEL1$)

> NOTE: This behaviour means that CAMEL may be used to establish forwarded-legs that violate conditional GSM outgoing call barring and ODB services. Network operators should take care to avoid problems that may arise because of this interaction.

$(end$(CAMEL1$)

18.8.3 Barring of outgoing international calls except those directed to the HPLMN country

As for Barring of outgoing international calls (see subclause 12.8.2).

18.8.4 Barring of all incoming calls

> [Editors Note: text to be drafted]

No interaction. The Barring of all incoming calls supplementary service shall be invoked. Thus, terminating CAMEL based services will not be invoked.

18.8.5 Barring of incoming calls when roaming

Same as Barring of all incoming calls (see subclause 12.8.4).

18.9 Explicit Call Transfer (ECT)

No interaction. An ECT call may include one or both calls legs subject to CAMEL based services. If a call leg is subject to CAMEL based services the CSE shall be able to instruct the VPLMN of the served subscriber whether that leg may be included in an explicitly transferred call.

18.10 Completion of Call to Busy Subscriber (CCBS)

See GSM 02.93 [1]. When a CCBS request is planted the CSE shall be able to instruct the VPLMN of the served subscriber whether CCBS is possible.

18.11 Multiple Subscriber Profile (MSP)

See GSM 02.97 [5].

19 Interactions with Operator Determined Barring (ODB)

19.1 Barring of all outgoing calls

Same principle as for subclause 12.8.1.

19.2 Barring of all outgoing international calls

Same principle as for subclause 12.8.2.

19.3 Barring of all outgoing international calls except those directed to the home PLMN country

Same principle as for subclause 12.8.3.

19.4 Barring of outgoing calls when roaming outside the home PLMN country

If the subscriber is outside her home PLMN country the Barring of outgoing calls when roaming outside the home PLMN country service will be invoked. Thus, originating CAMEL based services will not be invoked.

19.5 Barring of outgoing premium rate calls

Same principle as for subclause 13.3. The handling will be the same both for Premium rate information and Premium rate entertainment.

19.6 Barring of incoming calls

Same principle as for subclause 12.8.4.

19.7 Barring of incoming calls when roaming outside the home PLMN country

Same principle as for subclause 12.8.4.

19.8 Operator Specific Barring

No interaction. Any originating or terminating CAMEL based services shall be invoked before Operator Specific Barring of type 1,2,3,4. Operator Specific Barring is only applicable when registered in HPLMN.

NOTE: Operators should be aware of this interaction when defining Operator Specific ODB categories.

19.9 Barring of Supplementary Services Management

No interaction.

20 Interactions with Optimal Routeing (OR)

Invocation of OR shall not have any impact of any CAMEL based service.

If OR is applied to a late Call Forward then the interrogating PLMN shall invoke a mobile originated CAMEL based service, if required for the served subscriber.

$(begin$(CAMEL2$)

If OR of a basic mobile-to-mobile call is invoked, mobile originating services based on CAMEL phase 2 which rely on the destination of the MO call leg being determined by the dialled number (in particular, prepayment services) will not necessarily operate correctly.

If OR of late call forwarding is invoked from an IPLMN which is also the forwarding subscriber's HPLMN, then mobile terminating services based on CAMEL phase 2 which rely on the destination of the leg from the IPLMN being determined by the MSRN (in particular, prepayment services) will not necessarily operate correctly.

$(end$(CAMEL2$)

$(begin$(CAMEL3$)

When VPLMN-A contacts the CSE of the originating subscriber, it shall indicate whether it supports OR. If the CSE of the originating subscriber indicates that the call may be subject to basic OR, VPLMN-A shall act as an IPLMN and interrogate HPLMN-B as specified for SOR.

If a call is subject to basic OR, VPLMN-A shall pass the address defining the ultimate destination of the call (whether VPLMN-B, HPLMN-B or the forwarded-to destination) to the CSE of the originating subscriber.

If a call is subject to OR of late call forwarding from an IPLMN which is also the forwarding subscriber's HPLMN, then the IPLMN shall pass the forwarded-to number to the CSE which handles mobile terminating CAMEL-based services for the forwarding subscriber.

[Editors Note: Interaction with OR LCF R'96 has to be studied and text might be changed.]

$(end$(CAMEL3$)

Specific interaction is described in GSM 02.79 [2].

21 Cross Phase compatibility with future Phases of CAMEL

Where different entities support different phases of CAMEL they shall operate at the highest common phase. CAMEL phase 1 is the lowest common phase.

Annex A (normative):
Information Tables

A.1   Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various events. The numbers are reflecting the applicable Camel phase (!, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Call set-up request procedure 3	Call set-up request procedure 4	Unsuccessful call establishment	Incoming call request procedure	Procedures for serving network dialled services	Procedures for serving network dialled services
Event met	1	1	3	3	3	1	3	3
IMSI	1	1	3	3	3	1	3	3
Calling Party's Number	1	1	3	3	3	1	3	3
Calling Party's Category	1	1	3	3	-	1	3	3
Additional Calling Party Number	-	1	-	3	-	1	-	3
Called Party BCD Number	1	-	3	-	3	-	3	-
Called Party Number	-	1	-	3	-	1	-	3
Original Called Party Number	-	1	-	3	-	1	-	3
Redirecting (Party) Number ????	-	1	-	3	-	1	-	3
Redirection Information	-	1	-	3	-	1	-	3
Service Key	1	1	3	3	3	1	3	3
ISDN Bearer Capability	1	1	3	3	3	1	3	3
High Layer Compatibility	1	1	3	3	3	1	3	3
Basic Service Code	1	1	3	3	3	1	3	3
Call Identification Information	1	1	3	3	3	-	?	?
Location Information of the Calling Subscriber	1	-	3	-	3	-	3	-
Location Number of the Calling Subscriber	-	-	-	-	-	1	-	-
Location information of the called subscriber	-	-	-	-	-	1	-	-
Subscriber State of the called subscriber	-	-	-	-	-	1	-	-
Time and Time Zone Information - $(CAMEL2$)	2	2	3	3	3	2	?	?
Optimal Routing Indication - $(CAMEL3$)	-	-	?	?	-	-	3	3
Calling Party LSA (if available) $(CAMEL3$)	3	-	3	-	-	-	3	-
IMEI -$(CAMEL3$)	3	-	3	-	3	-	?	-
Terminal characteristics and capabilities (see MExE, 02.57) - $(CAMEL3$)	3	-	3	-	3	-	?	-
MExE classmark (see MExE, 02.57) -$(CAMEL3$)	3	-	3	-	3	-	?	-
NAEA Carrier Identification Code (CIC) -$(CAMEL3$)	3	3	3	3	3	3	3	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) -$(CAMEL3$)	3	3	3	3	3	3	3	3
NAEA Originating Line Identification (OLI) - $(CAMEL3$)	-	3	-	3	-	-	-	3
NAEA Charge Number (CN) - $(CAMEL3$)	-	3	-	3	-	-	-	3
CUG Index if received from the calling subscriber	3	-	-	-	-	-	-	-
CUG Interlock Code	-	-3	-	-	-	3	-	-
CUG Outgoing Access Indicator	-	-3	-	-	-	3	-	-

Table A-1: Information transferred towards the CSE.

A.2 Information sent by the CSE

The following table shows the information that is sent by the CSE on various events. The numbers are reflecting the applicable Camel phase (1, 2, 3).

	Call set-up request procedure 1	Call set-up request procedure 2	Unsuccessful call establishment (MO)	Call disconnection procedure (MO)	Creation of called parties	Incoming call request procedure	Unsuccessful call establishment (MT)	Call disconnection procedure (MT)	Procedures for serving network dialled services	CSE initiated call set up
Called Party Number	1	3	2	2	3	1	2	2	3	3
Calling Party Number	-	-	-	-	3	-	2	-	-	3
Calling Party's Category	1	3	2	2	3	1	2	2	3	3
Calling IMSI	-	-	-	-	-	-	-	-	-	3
ISUP CUG information	-	-	-	-	3	-	-	-	-	-
Additional Calling Party's Number	1	3	2	2	3	1	2	2	3	3
Original Called Party Number	1	3	2	2	-	1	2	2	3	-
Redirection Party Number	1	3	2	2	3	1	2	2	3	-
Redirection Information	1	3	2	2	3	1	2	2	3	-
Alerting Pattern	-	-	-	-	3	2	-	-	-	3
ISDN Access releated Information	-	-	-	-	3	-	-	-	-	3
ISDN Bearer Capability	-	-	-	-	3	-	-	-	-	3
High Layer Compatibility	-	-	-	-	-	-	-	-	-	-
Basic Service Code	-	-	-	-	-	-	-	-	-	-
Called Party to be Created	-	-	-	-	3	-	-	-	-	3
New Call Segment	-	-	-	-	3	-	-	-	-	3
In Service Compatibility Response	-	-	-	-	3	-	-	-	-	3
Service Interaction Indicators Two	-	-	-	-	3	-	-	-	-	3
Location Number	-	-	-	-	3	-	-	-	-	3
Optimal Routing Indication $(CAMEL3$)	3	3	3	2	3	3	3	3	-	3
NAEA Carrier Identification Code (CIC) - $(CAMEL3$)	-	3	3	3	3	3	3	3	-	3
NAEA Carrier Selection Information (pre-subscribed or on-demand) - $(CAMEL3$)	-	3	3	3	3	3	3	3	-	3
NAEA Originating Line Identification (OLI) - $(CAMEL3$)	-	3	3	3	3	3	3	3	-	3
NAEA Charge Number (CN) - $(CAMEL3$)	-	-	-	-	-	3	3	3	-	-
CSE Address	-	-	-	-	-	-	-	-	-	3
CUG Interlock Code	3	–3	-	-	-	3	-	-	-	-
CUG Outgoing Access Indicator	3	–3	-	-	-	3	-	-	-	-
Service Interaction Indicators	3	3			3	3				3

Table A-2: Information sent by the CSE.

A.3   GPRS Information provided to the CSE

The following table shows the information that is transferred towards the CSE on various GPRS events. The numbers are reflecting the applicable Camel phase (3).

	Attach procedure	PDP activation / Session Establishment	PDP activation / Session Establishment Acknowledgement
Event met	3	3	3
Type of monitoring	-	3	3
MSISDN	3	3	3
IMSI	3	3	3
Service Key	3	3	3
Location information at least to the resolution of Routing Area of the attaching subscriber	3	3	3
Time stamp information	3	3	3
Time zone information	3	3	3
GPRS MS Class	3	3	3
PDP transport protocol, i.e. IP or X.25	-	3	3
Quality of Service information (subscribed, requested,	-	3	3
Destination address information	-	3	3
GPRS charging correlation ID	-	-	3
Destination address information	-	-	3

Table A-3: GPRS Information transferred towards the CSE.

3G CHANGE REQUEST

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

22.078	**CR**	**028**		Current Version:	**3.0.0**

3G specification number ↑   *↑ CR number as allocated by 3G support team*

For submision to TSG [ ]   for approval [**X**]   *(only one box should*

list TSG meeting no. here ↑   for information [ ]   *be marked with an X)*

Form: 3G CR cover sheet, version 1.0   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

---

Proposed change affects: USIM [ ]   ME [ ]   UTRAN [ ]   Core Network [**X**]

(at least one should be marked with an X)

Source:	Vodafone	**Date:**	13/09/1999

Subject:	Addition of CCBS to the SS Invocation Notification

3G Work item:	MSP Phase 2

Category: F   Correction   [ ]

                   A   Corresponds to a correction in a 2G specification   [ ]

(only one category   B   Addition of feature   [**X**]

shall be marked   C   Functional modification of feature   [ ]

with an X)   D   Editorial modification   [ ]

Reason for change:	MSP Phase 2 requires CCBS recalls to be charged to the correct profile, hence notification of CCBS invocation is required.

Clauses affected:

Other specs   Other 3G core specifications   [X]   → List of CRs:

affected: Other 2G core specifications   [   ]   → List of CRs:

     MS test specifications   [   ]   → List of CRs:

     BSS test specifications   [   ]   → List of CRs:

     O&M specifications   [   ]   → List of CRs:

Other comments:

help.doc

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

1 Scope

This standard specifies the stage 1 description for 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.

CAMEL is developed in phases. The following phases exist:

- CAMEL phase 1. This is the default phase in this specification. Text that are only applicable to phase 1 are characterised with the formal designator - $(CAMEL1$)

- CAMEL phase 2. It is characterised where necessary with the formal designation - $(CAMEL2$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL2$)

- CAMEL phase 3. It is characterised where necessary with the formal designation - $(CAMEL3$) and sometimes with an indication of CAMEL phase 2. - $(CAMEL3$)

The CAMEL feature is applicable

- to mobile originated and mobile terminated call related activities;

- as a CAMEL phase 2 function, to supplementary service invocations - $(CAMEL2$);

- as a CAMEL Phase 3 function, to SMS MO, to GPRS sessions, to the control of HLR subscriber data, to control different call party connections, to the control of network signalling load and, - $(CAMEL3$);

- as a CAMEL Phase 3 function, to CSE created calls - $(CAMEL3$).

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 enhance the capabilities of phase 1 and are included in this standard. Following capabilities are added:

- Additional event detection points.

- Interaction between a user and 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 GSM supplementary services (ECT, CD, MPTY).

- For easy postprocessing, charging information from a serving node can be integrated in normal call records.

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

- Capabilities for enhanced handling of call party connections, together with the ability to handle more than 2 parties in a call

- Support of facilities to avoid overload situations.

- Capabilities to support Dialled Services.

- Capabilities to handle mobility events, such as (Not-)reachability and roaming.

- Control of GPRS sessions.

- Control of mobile originating SMS.

- Support of SoLSA. Support of Localised Service Area interworking is an optional feature. The support for interworking with mobile terminating calls is a requirement, however the specific details of how this will be realised is for further study - $(CAMEL3$)

- The CSE can be informed about the invocation of GSM supplementary services (CCBS) - $(CAMEL3$)

Detailed information can be found in the respective sections.

**** Last Modified Section ****

12.3   Supplementary service invocation notification to CSE $(CAMEL2$)

It shall be possible to mark for a subscriber that a notification shall be sent to the CSE when any of the following GSM supplementary services are invoked:

- ECT

- CD

- MPTY

- CCBS - $(CAMEL3$)

2

CHANGE REQUEST No :	**029**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 22.078   Version: 3.0.0

Submitted to SMG   SA#5   for approval [ ]   without presentation ("non-strategic") [ ]
list SMG plenary meeting no. here ↑   for information [ ]   with presentation ("strategic") [ ]

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 3

Source: Siemens AG   **Date:**   29 Sept. 1999

Subject: Clarification the behaviour when network provided dialled services are used.

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

Reason for change:

The present CR clarifies the behaviour when subscribed CAMEL services and dialled network based services has to interwork for one subscriber in the same call.

The conclusion of the CR is to put no restriction on network based services but to trigger them after subscribed and subscribed dialled services.

As a consequence of the CR and the modification to chapter 4, chapter 7 can be removed completely.

Clauses affected: Chapter 4 and 7

Other specs affected:

Other releases of same spec	[ ]	→ List of CRs:
Other core specifications	[ ]	→ List of CRs:
MS test specifications / TBRs	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments: The CR covers contributions given in doc S1-99271 and S1-99275.

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

The CAMEL Subscription Information (CSI) is provided by the HPLMN operator by administrative means.

The CSI may include the Translation Information Flag (TIF-CSI). If present for a subscriber the network will apply special handling of the call forwarding supplementary service. For details refer to section 12.3 $(CAMEL2$).

~~The Network CAMEL Service Information (N-CSI) for~~N-network-based services <u>may be</u> ~~is~~ provided by the serving PLMN operator. The provisioning mechanism is out of the scope of this specification. -$(CAMEL3$).

4.2   General Procedures

Each GSM 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 process and make contact with a CSE to ask for instructions or to send a notification. When a service event occurs, 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, and the corresponding CSE identity, which can initiate contact with the CSE is defined in the CAMEL Subscription 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; or - $(CAMEL3$);

-    the CSE creates a call - $(CAMEL3$).

In addition dialled <u>network based</u> services may be applicable in a PLMN if <u>so administered.</u> ~~the N-CSI is active in the PLMN.~~ -$(CAMEL3$)

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

-    Activate further service events for potential invocation. These events shall remain active only for the life-time 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 -$(CAMEL2$);

-    Order in band user interaction -$(CAMEL2$);

-     Create additional parties in the call - $(CAMEL3$);

-     Change the configuration of the connections between call parties - $(CAMEL3$).

$(begin$(CAMEL3$)

It shall be possible in the case of subscribed dialled services for the CSE to instruct the serving PLMN to:

- Continue the processing of the call, or;

- Connect the calling party to a specified called party;

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.

It should be possible in the case of sServing network-based services numbers may be treated after the above described behaviour. These services are outside the scope of the CAMEL specification.
Serving network based service numbers may be provided on the discretion of the network operator but they are outside this specification.

to:

    Continue the processing of the call, or;

    Connect the calling party to a specified called party.

Any other behaviour may cause misoperation of CAMEL based services.

$(end$(CAMEL3$)

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

- MT call;

- MO call (forwarded calls are treated as MO calls);

- supplementary service invocation -$(CAMEL2$);

- USSD user interaction. The of service codes for CAMEL services can be allocated on subscriber basis or globally for all subscribers of the HPLMN. -$(CAMEL2$);

- MO SM service $(CAMEL3$).

As part of an OSS it shall be possible for the CSE to interrogate for information about a particular subscriber at any time.

It shall be possible for the CSE to originate calls on behalf of a CAMEL subscriber - $(CAMEL3$).

4.3   Applicability of CAMEL to Basic Services

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

CAMEL procedures are applicable to GPRS session $(CAMEL3$).

7 Procedures for serving network dialled services $(CAMEL3$)

The purpose of this procedure is to detect a <u>match between the called party number and a stored network service number at the</u> call set-up request<u>.</u> ~~at the point where the called party number has been compared with the dialled services information and~~ <u>It is to</u> allow the CSE to modify the handling of the call set-up request. If this procedure is triggered it shall happen after processing of Subscriber Dialled Services triggered via the CSI.

7.1 Initiation of contact with the CSE

If:

- <u>the call set up request occurs and</u>

- <u>the call set up request procedure is passed and</u>

- the PLMN is provisioned with network <u>based</u> ~~CAMEL~~ service information ~~(N-CSI)~~; and

- ~~the call set-up request occurs;~~

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

For mobile originated calls the following information listed in table: A-1 (Procedures for serving network dialled services 1) shall be provided to the CSE if available.

For forwarded calls the information listed in table: A-1 (Procedures for serving network dialled services 2) shall be provided to the CSE if available.

7.2 Further processing of the call

When the serving network has made contact with the CSE, the CSE shall be able to instruct the serving network to act as described below by issuing one and only one of the following instructions:

- allow the call processing to continue unchanged;

- allow the call processing with modified information. The CSE shall have the possibility to send the information listed in table: A-2 (Procedures for serving network dialled services 2).

Further processing of the call continues as detailed in Sections 5.3 to 5.8, and the CSE contact initiated at this procedure is terminated.

CHANGE REQUEST No :	**A042**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*

Technical Specification GSM / UMTS: 02.78   Version: 6.3.0

Submitted to SMG   #30   for approval   **X**   without presentation ("non-strategic")   **X**
list SMG plenary meeting no. here ↑   for information   with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: CAMEL phase 2

Source: Camel Ad-Hoc   **Date:**   5 July 1999

Subject: Introduction of a "Health Warning" on type of numbers sent by the mobile other than "unknown" or

Category: F   Correction
            A   Corresponds to a correction in an earlier release
(one category   B   Addition of feature
and one release   C   Functional modification of feature
only shall be   D   Editorial modification   **X**
marked with an X)

Release: Phase 2
            Release 96
            Release 97   **X**
            Release 98
            Release 99
            UMTS

Reason for change: The joint meeting of ETSI SMG3 WP'C' and 3GPP TSG N2 considered a change request to GSM 03.78 for CAMEL phase 2. This change request proposed a change to the text of GSM 03.78 to align the requirements for triggering criteria with those in GSM 02.78 v6.3.0. There was some concern about the restriction that the type of number which can be stored in the triggering criteria can be only "international" or "unknown". This was felt to be too tight a constraint, because the protocol for the transport of the dialled number from the MS to the network allows the transport of other types of number. Even though the MMI specified in GSM 02.30 defines only the possibility to instruct the MS to send numbers in "unknown" or "international" format, automatic applications running in the MS or an attached terminal could cause the MS to send a number in format other than "unknown" or "international".

Clauses affected: 5.1

Other specs affected: Other releases of same spec   ☐   → List of CRs:
            Other core specifications   ☐   → List of CRs:
            MS test specifications / TBRs   ☐   → List of CRs:
            BSS test specifications   ☐   → List of CRs:
            O&M specifications   ☐   → List of CRs:

Other comments:

5.1 Criteria for contact with the CSE $(CAMEL2$)

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

The following criteria may be defined:

- Criteria on the dialled number consist of:

    - The contents of the dialled number (a list of up to 10 dialled number strings may be defined in the criteria. Each dialled number string may be in "unknown" or "international" format.);

    - The length of the dialled number (a list of up to three lengths may be defined.).

    The criteria on the dialled number may be collectively defined to be either "enabling" triggering criteria or "inhibiting" triggering criteria (see below). The HPLMN may also choose not to define any criteria on the dialled number.

- A criterion on the basic service: this consists of a list of basic service codes for individual basic services or basic service groups (the list shall be able to contain at least 5 basic service codes). The HPLMN may also choose not to define any criterion on the basic service.

- A criteria on the type of call: this consists of defining whether or not the call must be a forwarded call.

    A call is treated as forwarded in this respect either when either a GSM forwarding supplementary service applies or when the call is forwarded as a result of a terminating CAMEL based service. The HPLMN may also choose not to define any criterion on the type of call.

If the criteria on dialled number are "enabling" then the dialled number criteria are satisfied if:

- the dialled number matches a dialled number string defined in the criteria; or

- the length of the dialled number matches a dialled number length defined in the criteria.

If the criteria on the dialled number are "inhibiting" then the dialled number criteria are satisfied if:

- the dialled number does not match any of the dialled number strings defined in the criteria; and

- the length of the dialled number is not the same as any dialled number length defined in the criteria.

In these tests the dialled number matches one of the dialled number strings if:

- the two numbers are in the same format (unknown or international); and

- the dialled number is at least as long as the dialled number string in the criteria; and

- all the digits in the dialled number string in the criteria match the leading digits of the dialled number.

If no criterion on the dialled number is specified then the dialled number criteria are satisfied.

Note: Service designers should note that the MS can send dialled numbers to the network in other formats besides "international" or " unknown". If triggering criteria rely on the MS sending only "international" or "unknown" format numbers, the service behaviour will be unexpected if the MS sends a number which is not in "international" or "unknown" format.

The criterion on the basic service is satisfied if the basic service used for the call corresponds to any basic service code defined in the criterion or if no basic service criterion is specified.

The criterion on the type of call is satisfied if the type of the call is the same as the type defined in the criterion or if no call type criterion is specified.

The criteria on the call setup event procedure are satisfied if:

- the criteria on the dialled number are satisfied; and

- the criterion on the basic service is satisfied; and

- the criterion on the type of call is satisfied.