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**Source:** SA1  
**Title:** CRs to 22.078 for Rel-5 for CAMEL  
**Document for:** Approval  
**Agenda Item:** 7.1.3

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Doc-1st-Level	Spec	CR	Rev	Phase	Cat	Subject	Vers	Vers New	Doc-2nd-Level
SP-010674	22.078	124		Rel4	F	Removal of Volume charging for GPRS Session	4.3.0	4.4.0	991
SP-010674	22.078	125		Rel5	A	Removal of Volume charging for GPRS Session	5.4.0	5.5.0	1314
SP-010674	22.078	126		Rel-5	C	Use of start digit string as only criteria in Mid Call DP	5.4.0	5.5.0	965
SP-010674	22.078	127		Rel-5	C	Ability to arm Mid Call DP for the duration of a call	5.4.0	5.5.0	968
SP-010674	22.078	128	1	Rel-5	C	Introduction of subscriber status information in PS domain	5.4.0	5.5.0	1312
SP-010674	22.078	129		Rel5	C	CR to 22.078 (Ability to re-arm the event in the change of position procedures during a call)	5.4.0	5.5.0	977
SP-010674	22.078	130		Rel5	F	CR to 22.078 (Removal of call suspension in the change of position procedures)	5.4.0	5.5.0	1293

CR-Form-v4	CHANGE REQUEST
⌘ <b>22.078 CR 124</b> ⌘ ev <b>-</b> ⌘ Current version: <b>4.3.0</b> ⌘	

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Removal of Volume charging for GPRS Session		
<b>Source:</b>	⌘ SA1		
<b>Work item code:</b>	⌘ CAMEL Phase 3	<b>Date:</b>	⌘ 11 <sup>th</sup> November 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-4
	Use <u>one</u> of the following categories: <b>A</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)	

<b>Reason for change:</b>	⌘ S1-000540 originally removed the requirement for CAMEL controlled volume charging for a GPRS session in Release 99. Subsequently S1-000750 corrected an omission in S1-000540, again for Release 99. CAMEL Phase 3 for Release 99 is identical in service requirements for Release 4. The original change captured in S1-000540 was applied to Release 4 however it transpires that the change agreed in S1-00750 was not applied to Release 4. The purpose of this change is to align Release 4 with Release 99.
<b>Summary of change:</b>	⌘ The changes originally proposed in S1-00750 are applied to the Release 4 specifications and the requirement for volume controlled charging for a GPRS session is removed.
<b>Consequences if not approved:</b>	⌘ Service designers may be lead to believe that it may be possible to provide control over data volume for a GPRS session where this is not supported in the stage 2 and stage 3 for Release 4.

<b>Clauses affected:</b>	⌘ 10.3		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘ This change has no impact on TSG CN WG 2.		

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.htm). Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 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

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

The information listed in table: A-3 (Attach) 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 subsequent control service events for the period being attached to the data network. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - PDP Context Establishment request;
    - PDP Context Establishment Acknowledgement;
    - Change of position (session);
    - Detach;
    - Type of monitoring
  - Perform charging activities (amongst others defining a ~~data or~~ time threshold). The charging activities shall apply to the GPRS Session.

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;
- Continue the processing.

CR-Form-v4

## CHANGE REQUEST

⌘ **22.078 CR 125** ⌘ ev **-** ⌘ Current version: **5.4.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Removal of Volume charging for GPRS Session		
<b>Source:</b>	⌘ SA1		
<b>Work item code:</b>	⌘ CAMEL Phase 3	<b>Date:</b>	⌘ 9 <sup>th</sup> November 2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		REL-4 (Release 4)
			REL-5 (Release 5)

<b>Reason for change:</b>	⌘ S1-000540 originally removed the requirement for CAMEL controlled volume charging for a GPRS session in Release 99. Subsequently S1-000750 corrected an omission in S1-000540, again for Release 99. The original change captured in S1-000540 was applied to Release 5 however it transpires that the change agreed in S1-00750 was not applied to Release 5. The purpose of this change is to align Release 5 with Release 99 and Release 4 to ensure consistent requirements.
<b>Summary of change:</b>	⌘ The changes originally proposed in S1-000750 are applied to the Release 4 specifications and the requirement for volume controlled charging for a GPRS session is removed.
<b>Consequences if not approved:</b>	⌘ Service designers may be lead to believe that it may be possible to provide control over data volume for a GPRS session where this is not supported.

<b>Clauses affected:</b>	⌘ 10.3		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘ <input type="checkbox"/>	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘ This change has no impact on TSG CN WG 2.		

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.htm). Below is a brief summary:

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## 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

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

The information listed in table: A-3 (Attach) 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 subsequent control service events for the period being attached to the data network. The CSE shall have the possibility to send the following information:
  - The subsequent service event which shall be detected and reported:
    - PDP Context Establishment request;
    - PDP Context Establishment Acknowledgement;
    - Change of position (session);
    - Detach;
    - Type of monitoring
  - Perform charging activities (amongst others defining a ~~data or~~ time threshold). The charging activities shall apply to the GPRS Session.

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;
- Continue the processing.

CR-Form-v4			
<b>CHANGE REQUEST</b>			
<b>22.078</b>	<b>CR</b>	<b>126</b>	rev <input type="text"/>
			Current version: <b>5.4.0</b>

**Proposed change affects:** (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	Use of start digit as only criteria in Mid Call DP		
<b>Source:</b>	SA1		
<b>Work item code:</b>	CAMEL4	<b>Date:</b>	09/11/2001
<b>Category:</b>	<b>C</b>	<b>Release:</b>	REL-5
Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)	

<b>Reason for change:</b>	Some CAMEL services require the Mid Call DP to be triggered using only the start digit string. (Currently this is not possible as the minimum number of digits >0 and does not include the start digit string)
<b>Summary of change:</b>	To align with the Prompt And Collect User Information IE, the start digit string and end digit string should be included in the minimum and maximum number of digits. This is stated (for Prompt And Collect User Information) in 29.078, and clarified here.
<b>Consequences if not approved:</b>	Inconsistency between triggering criteria for Mid Call DP and Prompt & Collect User Information, causing confusion for service designers.

<b>Clauses affected:</b>	5.7 and 6.7		
<b>Other specs affected:</b>	<input checked="" type="checkbox"/>	Other core specifications	23.078 (N2-010710)
	<input type="checkbox"/>	Test specifications	
	<input type="checkbox"/>	O&M Specifications	
<b>Other comments:</b>			

**\*\*\* First Modified Section \*\*\***



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## 5 Procedures for Mobile Originated Calls and Forwarded Calls

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### 5.7 Mid call procedure \$(CAMEL4\$)

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 CSE shall not specify any criteria against a pattern of out-band information.

In the following, each digit shall be taken from the ordered set (0 - 9, \*, #).

The criterion consists of a list defining:

- The minimum number of digits to be collected, and
- The maximum number of digits to be collected, and
- The maximum delay between successive digits, and optionally
- The digit(s) used to indicate the start of the input, and optionally
- The digit(s) used to indicate the end of the input, and optionally
- The digit(s) used to indicate that the input shall be cancelled.

[The minimum and maximum number of digits to be collected includes the digit\(s\) used to indicate the start and end of the input.](#)

A digit string has been cancelled if:

- The CSE has specified digit(s) used to indicate that the input shall be cancelled, and
- The specified digit(s) has/have been received from the user.

If the CSE has specified digit(s) used to indicate the start of the input, then the input has started if:

- The specified digit(s) has/have been received from the user, and
- The digit string has not been cancelled.

If the CSE has not specified digit(s) used to indicate the start of the input, then the input has started if:

- At least one digit has been received from the user, and
- The digit string has not been cancelled.

If the CSE has specified digit(s) used to indicate the end of the input, then the input has ended if:

- The specified digit(s) has/have been received from the user, or
- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

If the CSE has not specified digit(s) used to indicate the end of the input, then the input has ended if:

- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

A digit string satisfies the criterion for the Mid call detection point if:

- The input has started, and
- The digit string contains at least the minimum number of digits, and
- The input has ended.

Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disarm the mid-call event.

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 the served subscriber 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;
- Type of monitoring;
- Event specific data:
  - Received DTMF digits or the received out of band 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;
- 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 or out of band information).
  - 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).
- Order in-band user interaction.

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

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

**\*\*\*\* Last Modified Section \*\*\*\***

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## 6 Procedures for Mobile Terminated Calls

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### 6.7 Mid Call procedure \$(CAMEL4\$)

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 CSE shall not specify any criteria against a pattern of out of band information.

In the following each digit shall be taken from the ordered set (0 - 9, \*, #).

The criterion consists of a list defining:

- The minimum number of digits to be collected, and
- The maximum number of digits to be collected, and
- The maximum delay between successive digits, and optionally
- The digit(s) used to indicate the start of the input, and optionally
- The digit(s) used to indicate the end of the input, and optionally
- The digit(s) used to indicate that the input shall be cancelled.

The minimum and maximum number of digits to be collected includes the digit(s) used to indicate the start and end of the input.

A digit string has been cancelled if:

- The CSE has specified digit(s) used to indicate that the input shall be cancelled, and
- The specified digit(s) has/have been received from the user.

If the CSE has specified digit(s) used to indicate the start of the input, then the input has started if:

- The specified digit(s) has/have been received from the user, and
- The digit string has not been cancelled.

If the CSE has not specified digit(s) used to indicate the start of the input, then the input has started if:

- At least one digit has been received from the user, and
- The digit string has not been cancelled.

If the CSE has specified digit(s) used to indicate the end of the input, then the input has ended if:

- The specified digit(s) has/have been received from the user, or
- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

If the CSE has not specified digit(s) used to indicate the end of the input, then the input has ended if:

- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

A digit string satisfies the criterion for the Mid call detection point if:

- The input has started, and

- The digit string contains at least the minimum number of digits, and
- The input has ended.

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 or the out of band 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
- 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);
    - Received out-band information.
  - 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).
- Order in-band user interaction

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

- Release the call;
- Continue the call processing.

**\*\*\*\* End of Document \*\*\*\***

CR-Form-v4	
<b>CHANGE REQUEST</b>	
<b>22.078 CR 127</b>	rev <input type="text"/> Current version: <b>5.4.0</b>

**Proposed change affects:** (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	Ability to arm Mid Call DP for the duration of a call		
<b>Source:</b>	SA1		
<b>Work item code:</b>	CAMEL4	<b>Date:</b>	09/112001
<b>Category:</b>	<b>C</b>	<b>Release:</b>	REL-5
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Use <u>one</u> of the following releases: <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)	

<b>Reason for change:</b>	Some services using the Mid-Call event may require the event to be armed for the duration of the call regardless of how many times the event is encountered.
<b>Summary of change:</b>	When arming the Mid-Call event, the CSE can instruct the VPLMN to automatically re-arm the Mid-Call event whenever it is encountered.
<b>Consequences if not approved:</b>	If a service requires the Mid-Call event to be armed for the duration of a call, the CSE would need to maintain a control relationship for the duration of the call and instruct the VPLMN to re-arm the mid-call event each time it is encountered.

<b>Clauses affected:</b>	5.7 and 6.7	
<b>Other specs affected:</b>	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	
<b>Other comments:</b>		

\*\*\* First Modified Section \*\*\*

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## 5 Procedures for Mobile Originated Calls and Forwarded Calls

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## 5.7 Mid call procedure \$(CAMEL4\$)

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 CSE shall not specify any criteria against a pattern of out-band information. [It shall be possible for the CSE to instruct the VPLMN to re-arm the mid-call event when it is encountered.](#)

In the following, each digit shall be taken from the ordered set (0 - 9, \*, #).

The criterion consists of a list defining:

- The minimum number of digits to be collected, and
- The maximum number of digits to be collected, and
- The maximum delay between successive digits, and optionally
- The digit(s) used to indicate the start of the input, and optionally
- The digit(s) used to indicate the end of the input, and optionally
- The digit(s) used to indicate that the input shall be cancelled.

A digit string has been cancelled if:

- The CSE has specified digit(s) used to indicate that the input shall be cancelled, and
- The specified digit(s) has/have been received from the user.

If the CSE has specified digit(s) used to indicate the start of the input, then the input has started if:

- The specified digit(s) has/have been received from the user, and
- The digit string has not been cancelled.

If the CSE has not specified digit(s) used to indicate the start of the input, then the input has started if:

- At least one digit has been received from the user, and
- The digit string has not been cancelled.

If the CSE has specified digit(s) used to indicate the end of the input, then the input has ended if:

- The specified digit(s) has/have been received from the user, or
- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

If the CSE has not specified digit(s) used to indicate the end of the input, then the input has ended if:

- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

A digit string satisfies the criterion for the Mid call detection point if:

- The input has started, and
- The digit string contains at least the minimum number of digits, and
- The input has ended.

Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall disarm the mid-call event.

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 the served subscriber 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;
- Type of monitoring;
- Event specific data:
  - Received DTMF digits or the received out of band 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;
- 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 or out of band information).
  - 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).
- Order in-band user interaction.

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

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

**\*\*\*\* Last Modified Section \*\*\*\***

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## 6 Procedures for Mobile Terminated Calls

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### 6.7 Mid Call procedure \$(CAMEL4\$)

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 CSE shall not specify

any criteria against a pattern of out of band information. [It shall be possible for the CSE to instruct the VPLMN to re-arm the mid-call event when it is encountered.](#)

In the following each digit shall be taken from the ordered set (0 - 9, \*, #).

The criterion consists of a list defining:

- The minimum number of digits to be collected, and
- The maximum number of digits to be collected, and
- The maximum delay between successive digits, and optionally
- The digit(s) used to indicate the start of the input, and optionally
- The digit(s) used to indicate the end of the input, and optionally
- The digit(s) used to indicate that the input shall be cancelled.

A digit string has been cancelled if:

- The CSE has specified digit(s) used to indicate that the input shall be cancelled, and
- The specified digit(s) has/have been received from the user.

If the CSE has specified digit(s) used to indicate the start of the input, then the input has started if:

- The specified digit(s) has/have been received from the user, and
- The digit string has not been cancelled.

If the CSE has not specified digit(s) used to indicate the start of the input, then the input has started if:

- At least one digit has been received from the user, and
- The digit string has not been cancelled.

If the CSE has specified digit(s) used to indicate the end of the input, then the input has ended if:

- The specified digit(s) has/have been received from the user, or
- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

If the CSE has not specified digit(s) used to indicate the end of the input, then the input has ended if:

- The maximum number of digits has been received, or
- The maximum delay between successive digits has been exceeded.

A digit string satisfies the criterion for the Mid call detection point if:

- The input has started, and
- The digit string contains at least the minimum number of digits, and
- The input has ended.

Triggering of the mid-call event shall occur immediately after the criterion has been satisfied. Once the triggering occurs the VPLMN shall [disarm the mid-call event](#)~~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 or the out of band 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
- 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);
    - Received out-band information.
  - 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).
- Order in-band user interaction

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

- Release the call;
- Continue the call processing.

**\*\*\*\* End of Document \*\*\*\***

CR-Form-v4

## CHANGE REQUEST

⌘ **22.078 CR 128** ⌘ rev **1** ⌘ Current version: **5.4.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Introduction of subscriber status information in PS domain		
<b>Source:</b>	⌘ SA1		
<b>Work item code:</b>	⌘ CAMEL4	<b>Date:</b>	⌘ 9 <sup>th</sup> Nov 2001
<b>Category:</b>	⌘ C	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ Together with CR 22.078-102 the ATI enhancement regarding subscriber status and location information for GPRS was introduced. However the requirements regarding the subscriber status information provided to the CSE was not detailed. This CR clarifies the appropriate subscriber status information that may be reported to the CSE.
<b>Summary of change:</b>	⌘ Add reference to 23.060; separate subscriber status definition into definitions for the circuit switched domain and the packet switched domain; add a new mobility management event for GPRS; add requirement for the CSE to indicate whether information is requested from HPLMN, VPLMN in the CS domain or VPLMN in the PS domain.
<b>Consequences if not approved:</b>	⌘ Query for subscriber state information will not be available in CAMEL Phase 4

<b>Clauses affected:</b>	⌘ 2; 3; 12.1; 13.1		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	23.078; 29.002
<b>Other comments:</b>	⌘ The introduction of this feature has impact on the following CN groups: CN 2: minor impact during the development of CAMEL Phase 4 CN 4: minor impact during the definition of MAP Rel-5		

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.htm). Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## \*\*\*\* First modified section \*\*\*\*

## 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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 22.093: "Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1".
- [2] 3GPP TS 22.079: "Support of Optimal Routeing (SOR); Service definition (Stage 1)".
- [3] 3GPP TS 22.030: "Man-machine Interface (MMI) of the Mobile Station (MS) (Stage 1)".
- [4] 3GPP TS 22.090: "Stage 1 Decision of Unstructured Supplementary Service Data (USSD)".
- [5] 3GPP TS 22.097: "Multiple Subscriber Profile (MSP); Service definition (Stage 1)".
- [6] 3GPP TS 22.060: "General Packed Radio Service (GPRS); Service definition (Stage 1)".
- [7] 3GPP TS 22.057: "Mobile Environment (MExE); Service definition (Stage 1)".
- [8] 3GPP TS 22.071: "Location Services; Service Definition (Stage1)".
- [9] 3GPP TS 23.018: "Basic Call Handling; Technical Realization".
- [10] 3GPP TS 22.003: "Circuit teleservices supported by a public land mobile network (PLMN)".
- [11] 3GPP TS 22.228: "Service Requirements for IP multimedia Core Network; (Stage1)".
- [12] 3GPP TS 23.228: "IP Multimedia (IM) Subsystem - Stage 2".
- [13] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

## 3 Definitions and abbreviations

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- **Geographical information** indicates the location (latitude and longitude) of the served subscriber. When Cell ID or Location Area Code is known the latitude and longitude may be calculated as the nominal central point of the cell or of the location area; alternative mechanisms for determining latitude and longitude may also be supported. The uncertainty of the indicated location is part of the geographical information.
- **Geodetic Information** provides the same functional capability as geographical information; however it is encoded differently.
- **Cell ID** indicates the global identity of the current or last cell which the subscriber is using or has used if the subscriber is using GSM radio access. The VPLMN shall update the stored Cell ID at establishment of every radio connection and whenever the subscriber is handed over between cells.
- **Routing Area ID** indicates the global identity of the current or last GPRS routing area which the subscriber is using or has used if the subscriber is using GSM radio access in a GPRS serving network.
- **Service Area ID** indicates the global identity of the current or last service area which the subscriber is using or has used if the subscriber is using UMTS radio access. The VPLMN shall update the stored Service Area ID at establishment of every radio connection and whenever the subscriber is handed over between service areas.
- **VLR number** is the number of the serving VLR stored in the HPLMN.
- **Location status** indicates whether or not the location information has been confirmed by radio contact. If the location information has not been confirmed by radio contact a time stamp is sent indicating the time elapsed since the last radio contact with the subscriber.
- **Location number** is the number received on the incoming circuit (for an incoming call) or to be sent on the outgoing circuit (for an outgoing call).

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

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

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

- **CAMEL-busy:** The MS is engaged in a mobile-originated or mobile-terminated circuit-switched call.
- **Network determined not reachable:** The network can determine from its internal data that the MS is not reachable. This includes detached and purged mobile stations.
- **Assumed idle:** The MS is not CAMEL-busy or network determined not reachable.

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

- **Detached:** The network can determine from its internal data that the MS is not registered to the GPRS data network.
- **CAMEL-attached, MS not reachable for paging:** The MS is registered to the GPRS data network, but there are no PDP contexts active for this MS; the GPRS data network can determine from its internal data that the MS is not reachable for paging.
- **CAMEL-attached, MS may be reachable for paging:** The MS is registered to the GPRS data network, but there are no PDP contexts active for this MS; the GPRS data network has not determined from its internal data that the MS is not reachable for paging.
- **CAMEL-connected, MS not reachable for paging:** The MS is registered to the GPRS data network, and there is at least one PDP context active for this MS; the GPRS data network can determine from its internal data that the MS is not reachable for paging. The status includes the information for each active PDP context, as specified in 3GPP TS 23.060 [13].
- **CAMEL-connected, MS may be reachable for paging:** The MS is registered to the GPRS data network, and there is at least one PDP context active for this MS; the GPRS data network has not determined from its internal data that the MS is not reachable for paging. The status includes the information for each active PDP context, as specified in 3GPP TS 23.060 [13].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**\*\*\*\* Next modified section \*\*\*\***

## 12.1 Mobility management

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 one or more of the following mobility events:

- For a CS subscriber:
  - ~~CS~~-Location area update of MS to a different VLR service area;
  - ~~CS~~-Location area update of MS within the same VLR service area;
  - ~~GPRS Routing area update of MS to a different SGSN service area;~~
  - ~~GPRS Routing area update of MS within the same SGSN service area;~~
  - MS-initiated ~~CS~~-detach (e.g. MS switched off);
  - ~~MS initiated GPRS detach (e.g. MS switched off);~~
  - Network initiated ~~CS~~-detach (periodic location update of MS failed);
  - Attach of MS ~~for a CS subscriber~~ (e.g. MS switched on, successful location update after network initiated detach);
- For a GPRS subscriber:
  - ~~Routing area update of MS to a different SGSN service area;~~
  - ~~Routing area update of MS within the same SGSN service area;~~
  - ~~MS-initiated detach (e.g. MS switched off);~~
  - ~~Network initiated transfer to "MS not reachable for paging" (periodic routing area update of MS failed);~~
  - Attach of MS ~~for GPRS subscriber~~ (e.g. MS switched on, successful routing area 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 phases supported at the VPLMN.

**\*\*\*\* Next modified section \*\*\*\***

## 13.1 Any time interrogation

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 (see section 22);
- Call Forwarding SS data;
- Call Barring SS data;
- Operator Determined Barring data;
- CAMEL Subscription Information;
- CAMEL phases supported at the VPLMN.

The CSE shall indicate in the request for subscriber information whether the information is requested from the HPLMN, the VPLMN in the circuit switched domain or the VPLMN in the packet switched domain.

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

**\*\*\*\* End of document \*\*\*\***



CR-Form-v4

## CHANGE REQUEST

⌘ **22.078 CR 129** ⌘ ev **-** ⌘ Current version: **5.4.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Ability to re-arm the event in the change of position procedures during a call		
<b>Source:</b>	⌘ SA1		
<b>Work item code:</b>	⌘ CAMEL4	<b>Date:</b>	⌘ 09/11/2001
<b>Category:</b>	⌘ <b>C</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		REL-4 (Release 4)
			REL-5 (Release 5)

<b>Reason for change:</b>	⌘ The change of position event may occur several times during a call. As some services using the change of position event may require the event to be armed for the duration of the call regardless of how many times the event is encountered, it is useful for the CSE to instruct the VPLMN to re-arm the event automatically.
<b>Summary of change:</b>	⌘ When arming the change of position event, the CSE can instruct the VPLMN to re-arm the change of position event automatically whenever it is encountered.
<b>Consequences if not approved:</b>	⌘ If a service requires the change of position event to be armed for the duration of a call, the CSE would need to instruct the VPLMN to arm the change of position event each time it is encountered. This would lead the increase of signalling load.

<b>Clauses affected:</b>	⌘ 5.12 and 6.12	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘
	<input type="checkbox"/> Test specifications	
	<input type="checkbox"/> O&M Specifications	
<b>Other comments:</b>	⌘ This is already implemented in stage 2 by CN2	

## 5.12 Change of position procedure \$(CAMEL4\$)

When the CSE instructs the VPLMN to arm the change of position event, the VPLMN shall report the event when the subscriber's location information changed. [It shall be possible for the CSE to instruct the VPLMN to re-arm the change of position event when it is encountered.](#)

If the CSE has activated this service event for the served subscriber and a change of position 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;
- Type of monitoring;
- Event specific data;
  - Location information:
- Charge result if charging supervision is provided:

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:
    - Change of position event.
  - The party in the call for which the event shall be detected and reported;
  - The type of monitoring (control or notification);
  - Order in-band user interaction.

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

- Continue the call processing;
- Release the call.

## 6.12 Change of position procedure \$(CAMEL4\$)

When the CSE instructs the VPLMN to arm the change of position event, the VPLMN shall report the event when the subscriber's location information changed. [It shall be possible for the CSE to instruct the VPLMN to re-arm the change of position event when it is encountered.](#)

If the CSE has activated this service event for the served subscriber and a change of position 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;
- Type of monitoring;
- Event specific data;
- Location information:
- Charge result if charging supervision is provided:

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:
    - Change of position event.
  - The party in the call for which the event shall be detected and reported;
  - The type of monitoring (control or notification);
  - Order in-band user interaction.

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

- Continue the call processing;
- Release the call.

*** End of document ***
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CR-Form-v4	
<b>CHANGE REQUEST</b>	
⌘ <b>22.078</b> CR <b>130</b> ⌘ ev <b>-</b> ⌘	Current version: <b>5.4.0</b> ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

<b>Title:</b>	⌘ Removal of call suspension in the change of position procedures		
<b>Source:</b>	⌘ SA1		
<b>Work item code:</b>	⌘ CAMEL4	<b>Date:</b>	⌘ November 9 <sup>th</sup> 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ Call suspension in the change of position procedure upon the event occurred was originally intended to perform charging activity during the suspension. However it was clarified that the charging activity which includes revision of the call duration and release could be done without call suspension.
<b>Summary of change:</b>	⌘ Remove description which implies call suspension in the change of position procedure
<b>Consequences if not approved:</b>	⌘ Over-specification which would not be needed to realise the intended capability.

<b>Clauses affected:</b>	⌘ 5.12 and 6.12	
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘	

## 5.12 Change of position procedure \$(CAMEL4\$)

When the CSE instructs the VPLMN to arm the change of position event, the VPLMN shall report the event when the subscriber's location information changed.

If the CSE has activated this service event for the served subscriber and a change of position 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;
- Type of monitoring;
- Event specific data;
- Location information;
- Charge result if charging supervision is provided:

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:
    - Change of position event.
  - The party in the call for which the event shall be detected and reported;
  - The type of monitoring (~~control or~~ notification);
  - Order in-band user interaction.

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

- ~~— Continue the call processing;~~
- ~~— Release the call.~~

## 6.12 Change of position procedure \$(CAMEL4\$)

When the CSE instructs the VPLMN to arm the change of position event, the VPLMN shall report the event when the subscriber's location information changed.

If the CSE has activated this service event for the served subscriber and a change of position 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;
- Type of monitoring;
- Event specific data;
- Location information;
- Charge result if charging supervision is provided;

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:
    - Change of position event.
  - The party in the call for which the event shall be detected and reported;
  - The type of monitoring (~~control or~~ notification);
  - Order in-band user interaction.

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

~~— Continue the call processing;~~

~~— Release the call.~~

\*\*\* End of document \*\*\*