3GPP TSG CN Plenary **Tdoc NP-000616**
Meeting #10, Bangkok, Thailand
6th – 8th December 2000

Source: **TSG CN WG 2**

Title: **CRs to R99 Work Item CAMEL3, 23.078 part 2**

Agenda item: **7.2**

Document for: **APPROVAL**

Introduction:

This document contains **6** CRs on **R99** Work Item **"CAMEL3"**, that have been agreed by **TSG CN WG2**, and are forwarded to TSG CN Plenary meeting #10 for approval.

SPEC	CR	REV	TDoc	PHAS	SUBJECT	CAT	OLD VER
23.078	232	4	N2-000642	R99	First set of corrections of paragraph 6 GPRS	F	3.6.0
23.078	247		N2-000597	R99	Request more than one SS data and/or CSI in one ATSI	F	3.6.0
23.078	248	2	N2-000673	R99	Improved description of the location information in SGSN	F	3.6.0
23.078	249	2	N2-000672	R99	Error handling in ATSI	F	3.6.0
23.078	250	2	N2-000685	R99	Additional clarification for ATM	F	3.6.0
23.078	255		N2-000645	R99	Introduction of GGSN Address	F	3.6.0

3GPP CN2 Meeting #15
Paris, France, 13th – 17th November, 2000

***Document* N2-000597**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.078	CR	247	Current Version:	3.6.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG CN#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME		UTRAN / Radio		Core Network	X

Source:	Siemens	**Date:** 10/11/2000
Subject:	Request more than one SS data and/or CSI in one ATSI request	
Work item:	CAMEL Phase 3	

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

- Current ATSI definition in the MAP specification 29.002 allows to handle more than one SS data and/or CSI as the return result, i.e. it is capable to send all the SS data and CSI which are defined in the CAMEL phase 3. However the request (argument) allows only one of each SS data and CSI. – The inconsistency shall be resolved.
- The inconsistency between the definitions of the argument and the return result would require multiple request if the SCP would like to obtain several SS data and/or CSI, despite of full capability of the return result. – Solving the inconsistency provides the efficient signalling usage.

Clauses affected: 10

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	29.002-xxx
Other GSM 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:

***** Next change in clause 10 *****

10.3.1.1 Any Time Subscription Interrogation Request

10.3.1.1.1 Description

This IF is used to request subscription information from the HLR at any time.

10.3.1.1.2 Information Elements

The following information elements are required:

Information element name	Required	Description
GsmSCF Address	M	This IE indicates the address of the interrogating gsmSCF.
Requested Info	M	This IE indicates the type of subscriber information being requested: This ~~can be~~ shall consist of one ~~of~~or more of the following list: - supplementary service list, described in a table below - Operator Determined Barring - CAMEL Subscription Information, described in a table below - supported CAMEL phases in VLR - supported CAMEL phases in SGSN
Subscriber Identity	M	This IE identifies the subscriber for which the information is requested. The identity shall be~~can be~~ either~~one of~~: - IMSI, or - MSISDN

M Mandatory (The IE shall always be sent).

CR editor's note: Yellow shading parts above have already been approved by CN2 (CR 23.078-228r3, N2-000550)

Supplementary service list contains a list of supplementary services, each of which contains the following information:

Information element name	Required	Description
SS code	M	This IE indicates a supplementary service as defined in 3G TS 22.004 [25]. Only the Call Forwarding and Call Barring supplementary services are allowed for this IE.
Basic Service	O	See 3G TS 22.002 [24].

M Mandatory (The IE shall always be sent).

O Optional (Service Logic Dependent).

CAMEL subscription information contains the following information:

Information element name	Required	Description
CAMEL subscription information	M	This IE indicates which CAMEL Subscription Information is requested. It shall consist of ~~may be~~ one or more of the following elements: O-CSI/T-CSI/VT-CSI/TIF-CSI/GPRS-CSI/SMS-CSI/SS-CSI/M-CSI/D-CSI

M Mandatory (The IE shall always be sent).

3GPP TSG CN WG2
Paris, France 13–17 of November 2000

Document ***N2-000642***
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.078	**CR**	**232r4**	Current Version:	3.6.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN #10 *list expected approval meeting # here ↑*

for approval [X]
for information [ ]

strategic [ ]
non-strategic [ ]
(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: Alcatel **Date:** 15/11/00

Subject: First set of corrections of paragraph 6 GPRS

Work item: CAMEL Phase 3

Category: *(only one category 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]
				Release 00	[ ]

Reason for change: Various corrections in the GPRS paragraph

Clauses affected: 6.1.1, 6.1.2.2, 6.2,6.4.2.1, 6.4.4

Other specs affected:

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

Paragraph 6.1.1: the word ‘only’ is deleted

Paragraph 6.1.2.2: introduction of GPRS dialogue

Paragraf 6.2: new

Paragraph: 6.4.2.1.1 and 6.4.2.1.2: deletion of the “STANDBY timer” as example of exeptional conditions

Paragraph 6.4.4: the disarming rules are now in 6.2.

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6 GPRS interworking

6.1 Architecture

6.1.1 Functional Entities used for CAMEL

This subclause describes the functional architecture needed to support GPRS interworking for CAMEL. Figure 6.1 shows the functional entities involved in a GPRS session requiring CAMEL support. The architecture is applicable to the third phase of CAMEL.

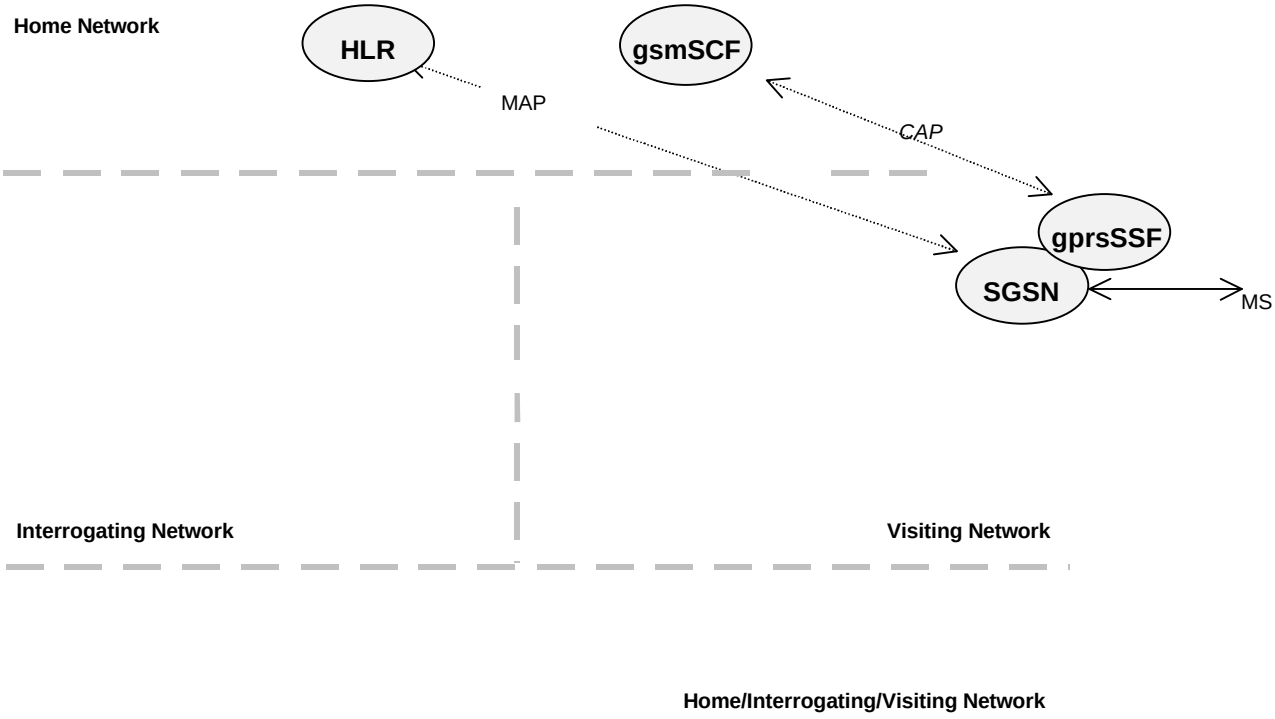

Figure 6.1: Functional architecture for support of CAMEL

HLR: The HLR stores for subscribers requiring CAMEL support the information relevant to the current subscription GPRS-CSI. The GPRS-CSI is stored in the HLR ~~only.~~.
SGSN: When processing GPRS Attach requests or Inter-SGSN Routeing Area Updates for subscribers requiring CAMEL support, the SGSN receives a GPRS-CSI from the HLR, indicating the SGSN to request instructions from the gprsSSF. The SGSN monitors on request the GPRS events and informs the gprsSSF of these events during processing, enabling the gprsSSF to control the execution of the GPRS session or individual PDP contexts in the SGSN.
gprsSSF: see subclause 3.1.
gsmSCF: see subclause 3.1.

6.1.2 Interfaces defined for CAMEL

6.1.2.1 SGSN - gprsSSF interface

This is an internal interface. The interface is described in the specification to make it easier to understand the handling of DPs (arming/disarming of DPs, DP processing etc.).

6.1.2.2 gprsSSF - gsmSCF interface

This interface is used by the gsmSCF to control a GPRS session or individual PDP Context in a certain gprsSSF. ~~Relationships~~GPRS dialogues between the gprsSSF and the gsmSCF ~~(GPRS dialogues)~~ on this interface are opened as a result of the gprsSSF sending a request for instructions to the gsmSCF. A GPRS dialogue is composed of a sequence of TC dialogues linked together by the same reference. The GPRS dialogue handler allows the TC dialogue handling.

6.1.2.3 HLR – SGSN interface

This interface is used to send CAMEL related subscriber data to a visited GPRS network, e.g. GPRS-CSI.

6.2 Detection Points (DPs)

~~See subclause 4.2.~~

6.2.1 Definition and description

GPRS events may be made visible to the gsmSCF. The DPs are the points in association at which these events are detected. The DPs for GPRS Session and PDP Context are described in subclause 6.4.2 and subclause 6.4.3.

A DP can be armed in order to notify the gsmSCF that the GPRS event was encountered, and to allow the gsmSCF to influence subsequent handling of the GPRS Session, or the PDP Context. If the DP is not armed, the processing entity continues the processing without gsmSCF involvement at this DP.

Three different types of DPs are identified :

1. Trigger Detection Point-Request (TDP-R): This detection point is statically armed and may initiate a CAMEL control relationship. This CAMEL control relationship is within a new GPRS dialogue. When the GPRS event is encountered and reported, processing is suspended.
2. Event Detection Point- Request (EDP-R): This detection point is dynamically armed within the context of a CAMEL control relationship. When the GPRS event is encountered, and reported, processing is suspended and the gprsSSF waits for instructions from the gsmSCF.
3. Event Detection Point-Notification (EDP-N): This detection point is dynamically armed within the context of a CAMEL control relationship. When the GPRS event is encountered and reported, processing is not suspended.

Arming/disarming mechanism:

A DP may be statically armed or dynamically armed. The following arming rules apply:

- DPs for GPRS Session and PDP Context are statically armed as a result of the GPRS-CSI analysis in the SGSN.
- DPs may be dynamically armed by the gsmSCF within the context of a CAMEL control relationship. In scenario 1 which is described in the subclause 6.4.4.1, PDP context related DPs may be armed as generic DP or as non-generic DP.

The following disarming rules apply:

- A statically armed DP is disarmed when the GPRS-CSI is withdrawn in the HLR. Only TDP-Rs can be disarmed using this mechanism.
- If the GPRS Session is released, then all EDPs related to the GPRS Session are disarmed.
- If a PDP context is released, then all non-generically armed EDPs related to that PDP context are disarmed.
- If a non-generically armed EDP is met, then EDPs for the GPRS Session or that PDP Context are disarmed, in accordance with the implicit disarming rule (see subclause 6.4.6).
- Armed EDPs may be explicitly disarmed by the gsmSCF by means of the Request Report BCSM Event information flow.

~~6.2.3~~6.2.2 Relationship, DP processing rules and GPRS dialogue

A relationship between the State Models (in the gprsSSF) and the gsmSCF for the purpose of operator specific service processing is considered to be a CAMEL relationship. There are two types of CAMEL relationships: monitor relationship and control relationship.

- A CAMEL control relationship: the gsmSCF is able to influence the GPRS Session/PDP Context via the relationship for the given state model.
- A CAMEL monitor relationship: the gsmSCF is not able to influence the GPRS Session/PDP Context via the relationship for the given state model.

A control relationship persists as long as there is one or more EDP-R armed for this instance of the state model, or if the gprsSSF is in the state Waiting For Instruction for this instance of state model.

A control relationship changes to a monitor relationship if the conditions for a control relationship are no longer fulfilled and one or more EDP-N is armed or one or more Apply Charging Report is outstanding for this instance of the state model. If no EDP-Ns are armed and no Apply Charging Reports are outstanding for this instance of the state model, the relationship terminates.

A GPRS dialogue exists between gprsSSF and gsmSCF if at least one of the following conditions is fulfilled:

- There is at least one EDP armed,
- At least one report is pending,
- gprsSSF is in state Waiting For Instructions

6.3 Description of CAMEL Subscriber Data

6.3.1 GPRS CAMEL Subscription Information (GPRS-CSI)

This subclause defines the contents of the GPRS CAMEL Subscription Information.

6.3.1.1 gsmSCF Address

Address to be used to access the gsmSCF for a particular subscriber. The address shall be an E.164 number to be used for routeing.

6.3.1.2 Service Key

The Service Key identifies to the gsmSCF the service logic that shall apply.

6.3.1.3 Default GPRS Handling

The Default GPRS Handling indicates whether the GPRS session or PDP context shall be released or continued as requested in case of error in the gprsSSF to gsmSCF dialogue.

6.3.1.4 TDP List

The TDP List indicates on which detection point triggering shall take place.

6.3.1.5 CAMEL Capability Handling

CAMEL Capability Handling indicates the phase of CAMEL which is asked by the gsmSCF for the service.

6.3.1.6 CSI state

The CSI state indicates whether the GPRS-CSI is active or not.

6.3.1.7 Notification flag

The notification flag indicates whether the change of the GPRS-CSI shall trigger Notification on Change of Subscriber Data or not.

6.3.1.8 gsmSCF address list for CSI

The gsmSCF address list contains a list of gsmSCF addresses to which Notification on Change of Subscriber Data is to be sent. This list is common to all CSI.

6.4 Description of CAMEL State Models

GPRS can support multiple PDP contexts simultaneously for an attached subscriber, requiring the behaviour of a GPRS session to be modelled by two state models, one for the attach/detach procedures (GPRS Attach/Detach State Model) and the other for modelling individual PDP Contexts (GPRS PDP Context State Model).

6.4.1 General Handling

The GPRS State Model is used to describe the actions in an SGSN during processing of a GPRS session or PDP Contexts.
The GPRS State Model identifies the points in basic GPRS processing when Operator Specific Service (OSS) logic instances (accessed through the gsmSCF) are permitted to interact with basic GPRS control capabilities.
Figure shows the components that have been identified to describe a GPRS State Model.

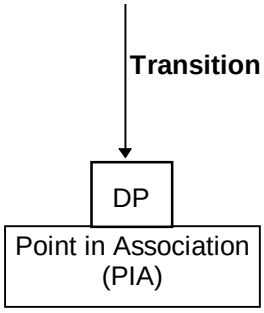

Figure 6.2: GPRS State Model Components

6.4.2 GPRS Attach/Detach State Model

The GPRS Attach/Detach State Model is used to model the behaviour of the GPRS attach/detach procedures.
When encountering a DP the Attach/Detach State Model processing is suspended at the DP and the SGSN indicates this to the gprsSSF which determines what action, if any, shall be taken in case the DP is armed.

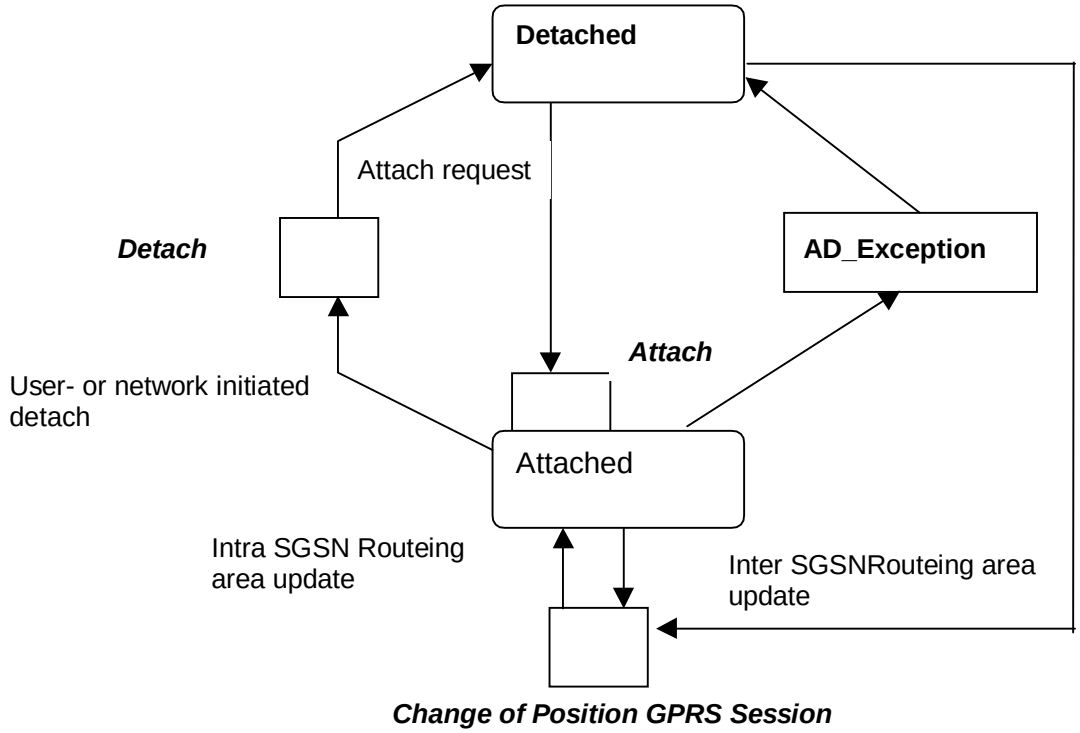

Figure 6.3: GPRS Attach/Detach State Model

Table 1: Description of GPRS Attach/Detach DPs in the SGSN

CAMEL Detection Point	DP Type	Description
DP Attach	TDP-R	A request to attach is received.
DP Change of Position GPRS Session	TDP-R[1)], EDP-N	Routeing Area Update is accepted.
DP Detach	EDP-N, EDP-R	A detach request is received either from the MS, the SGSN or a 'Cancel Location' received from HLR or Inter SGSN Routeing update occured in the old SGSN.
Note 1:Change of Position GPRS Session is reported as TDP-R in the case of Inter-SGSN Routeing Area Update (provided that this DP is statically armed in GPRS-CSI). Change of Position GPRS Session is reported as EDP-N in the case of Intra-SGSN Routeing Area Update (provided that this DP is dynamically armed by the Service Logic).		

6.4.2.1 Description of the Attach/Detach model (PIAs)

This subclause describes the model for the attach and detach a GPRS session in the SGSN. For each PIA a description can be found of the entry events, actions and exit events.

6.4.2.1.1 Detached

Entry events:

- Detach (user or network initiated) and clearing of a previous GPRS session.
- Processing of exceptional conditions~~., e.g. STANDBY timer expiry in the SGSN.~~

Actions:

- Interface is idled.
- Attach request is received from MS containing the IMSI/P-TMSI and the type of attach requested and, the identity of the MS is established (IMSI) (DP Attach), or Inter-SGSN Routeing Area Update Request is accepted (DP Chage of Position GPRS Session).
- Information being analyzed, e.g. GPRS-CSI is analyzed.

Exit events:

- GPRS-CSI is analyzed (DP Attach or DP Change of Position GPRS Session).

6.4.2.1.2 Attached

Entry events:

- GPRS-CSI is analyzed (DP Attach).

Actions:

- MM contexts are established at the MS and the SGSN.

Exit events:

- A GPRS Detach request is received from the MS ~~or the GGSN (DP Detach).~~or from the network (DP Detach).
- Intra-SGSN Routeing Area Update is accepted (DP Change of Position GPRS Session).
- An exception is encountered~~., e.g. STANDBY timer expiry.~~

The GPRS Attach/Detach State Model shall only have one or more GPRS PDP Context State Models associated with it when in the Attached state. A GPRS PDP Context State Model cannot exist without its associated GPRS Attach/Detach State Model being in the Attached state. Closure of the GPRS Attach/Detach State Model via a detach will result in the idling of all associated GPRS PDP Context State Models and the release of the associated GPRS PDP Contexts.
It shall not be necessary to trigger a relationship from the GPRS Attach/Detach State Model to the gsmSCF in order for triggering to occur in an associated GPRS PDP Context State Model. However, in this latter case a GPRS Attach/Detach State Model shall still exist at the SGSN. This is so that CSE-initiated detach events sent within a given GPRS PDP Context relationship shall result in the GPRS Attach/Detach State Model transiting to the Detached state. As noted above, in this state no PDP Contexts can exist and so all associated GPRS PDP Context State Models will transit to state Idle.

6.4.3 GPRS PDP Context State Model

The GPRS PDP Context State Model is used to model the behaviour for the GPRS PDP Context procedures. There is one PDP Context State Model per GPRS PDP context.
When encountering a DP the PDP Context State Model processing is suspended at the DP and the SGSN indicates this to the gprsSSF which determines what action, if any, shall be taken in case the DP is armed.

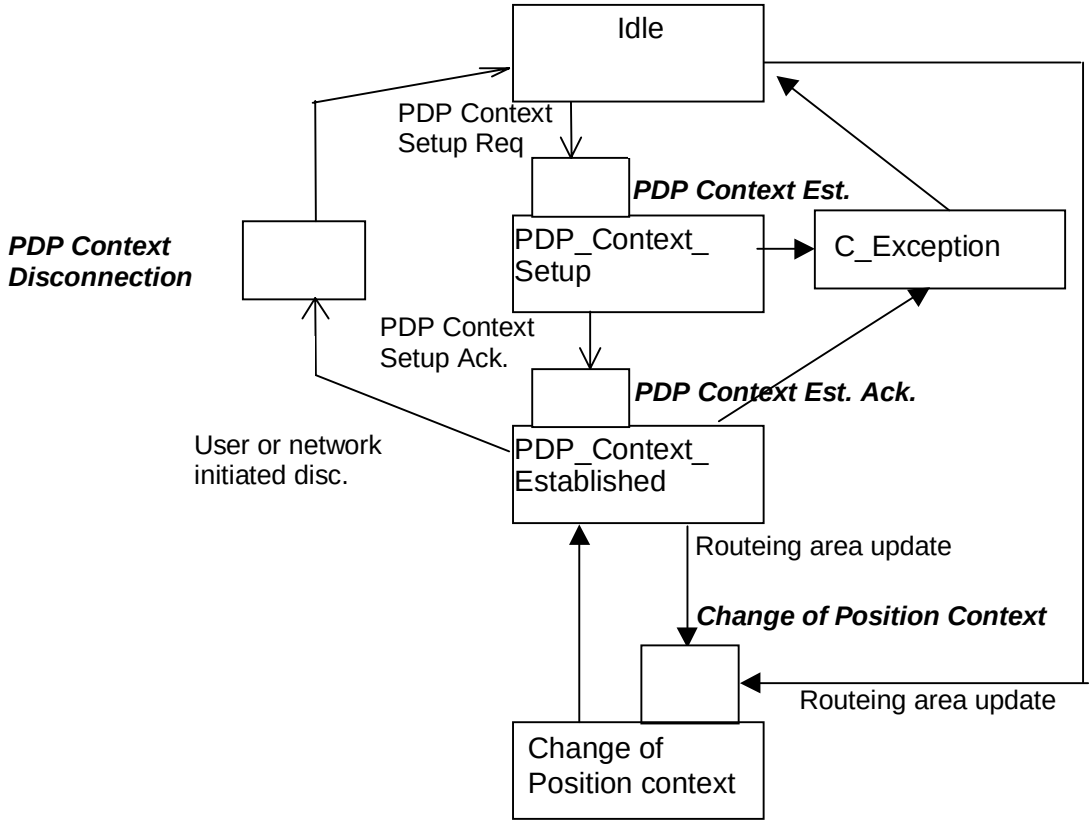

Figure 6.4: GPRS PDP Context State Model

Table 2: Description of GPRS PDP Context DPs in the SGSN

CAMEL Detection Point	DP Type	Description
DP PDP Context Establishment	TDP-R[1)], EDP-R	Activate PDP Context request is received from the MS.
DP PDP Context Establishment Acknowledgement	TDP-R[2)], EDP-R, EDP-N	Create PDP Context response is received from the GGSN.
DP PDP Context Disconnection	EDP-N, EDP-R	Deactivate PDP Context Request is received from the MS, Delete PDP Context request is received from the GGSN. Inter SGSN Routeing update occured in old SGSN.
DP Change of Position Context	TDP-R[3)], EDP-N, EDP-R	Routeing Area Update is accepted.

NOTE 1: The PDP Context Establishment shall be reported as TDP-R (provided that this DP is statically armed in GPRS-CSI) if there is no relationship with the gsmSCF. If there is a relationship with the gsmSCF it shall be reported as EDP-R or EDP-N if armed so.

NOTE 2: The PDP Context Establishment Acknowledgment shall be reported as TDP-R (provided that this DP is statically armed in GPRS-CSI) if there is no relationship with gsmSCF. If there is a relationship with the gsmSCF, it shall be reported as EDP-R or EDP-N if armed so.

NOTE 3: Change of Position Context is reported as TDP-R in the case of Inter-SGSN Routeing Area Update (provided that this DP is statically armed in GPRS-CSI) if there is no relationship with the gsmSCF.
Change of Position Context is reported as EDP-N or EDP-R in the case of Inter-SGSN Routeing Area Update (provided that this DP is armed as generic EDP) if there is a relationship with the gsmSCF.
Change of Position Context is reported as EDP-N in the case of Intra-SGSN Routeing Area Update (provided that this DP is dynamically armed by the Service Logic).

6.4.3.1 Description of the PDP Context model (PIAs)

This subclause describes the model for PDP Context State Model in the SGSN. For each PIA a description can be found of the entry events, actions and exit events.

6.4.3.1.1 Idle

Entry events:
- Deactivation (user or network initiated) and clearing of a previous PDP Context.
- Processing of exceptional conditions.

Actions:
- Interface is idled.
- Activate PDP Context request is received from MS (containing NSAPI, PDP Type, PDP Address, Access Point Name, QoS Requested, PDP Configuration Options), or Inter-SGSN Routeing Area Update is accepted (DP Change of Position Context).
- Information being analyzed, e.g. GPRS-CSI is analyzed.

Exit events:
- GPRS-CSI is analyzed (DP PDP Context Establishment or DP Change of Position Context, new SGSN).

6.4.3.1.2 PDP Context Setup

Entry events:
- GPRS-CSI is analyzed (DP PDP Context Establishment).

Actions:
- GGSN address is derived from the Access Point Name by interrogation of a DNS.
- Create PDP Context Request is sent to the GGSN.

Exit events:
- Create PDP Context Response is received from the the GGSN (DP PDP Context Establishment Acknowledgement).
- An exception is encountered.

6.4.3.1.3 PDP Context Established

Entry events:
- GPRS-CSI is analyzed (DP PDP Context Establishment Acknowledgement or DP Change of Position Context).

Actions:
- PDP context is established at the MS and the SGSN.

Exit events:
- Deactivation of the PDP Context is received from the MS or the GGSN, or is due to an inter SGSN routing area update (DP PDP Context Disconnection, old SGSN).
- Intra-SGSN Routeing Area Update Request is received from the MS (DP Change of Position Context).
- Inter-SGSN Routeing Area Update (DP Change of Position Context, new SGSN).
- An exception is encountered.

6.4.3.1.4 Change of Position Context

Entry events:
- Inter SGSN Routing Area update accepted (new SGSN).
- Intra SGSN Routeing Area update request received from the MS.

Actions:
- PDP Context (containing NSAPI, PDP Type, PDP Address, Access Point Name, QoS Requested, PDP Configuration Options) is reestablished in case of Inter-SGSN Routeing Area update accepted (new SGSN).
- Intra SGSN Routeing Area updated.

Exit events:
- reestablishement of the PDP context at the new SGSN and return to PDP context established in case of inter SGSN Routeing Area update accepted in new SGSN (PIA PDP context established).
- Routeing Area update completed in case of intra SGSN Routeing Area update (PIA PDP context established).

6.4.4 GPRS CAMEL Scenarios

Two different scenarios are applicable for CAMEL control of GPRS.
Scenario 1:
Scenario 1 allows CAMEL control of the GPRS session and of multiple PDP contexts related to this session within a single GPRS dialogue.
Scenario 2:
Scenario 2 allows CAMEL control of single PDP contexts. Multiple PDP contexts are controlled in this scenario via multiple GPRS dialogues.
Scenario 1 and scenario 2 are mutually exclusive, i.e. it is not possible to use both for one GPRS session at the same time in one SGSN. A GPRS session is involved in GPRS CAMEL at one moment in time either by using scenario 1 or by using possible multiple instances of scenario 2. GPRS sessions in different SGSNs are independent from a CAMEL perspective.
~~A GPRS dialogue exists between gprsSSF and gsmSCF if at least one of the following conditions is fulfilled:~~
~~- There is at least one EDP armed.~~
~~- At least one report is pending.~~
~~- gprsSSF is in state WaitingForInstructions.~~

6.4.4.1 GPRS CAMEL Scenario 1

Scenario 1 allows CAMEL control of the GPRS session and of multiple PDP contexts related to this session within a single GPRS dialogue (Session dialogue).

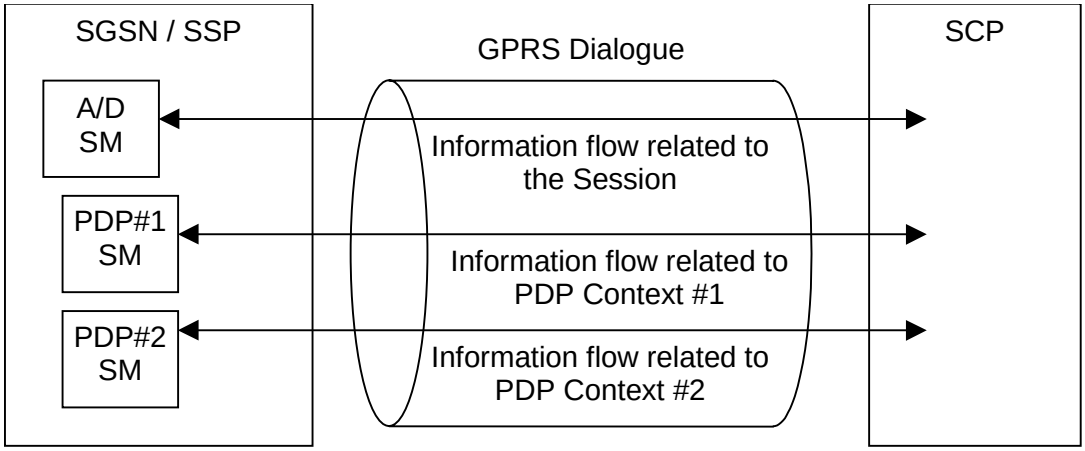

Figure 6.5: GPRS CAMEL Scenario 1

A GPRS dialogue in scenario 1 always consists of one GPRS Attach/Detach State Model and optionally of additional multiple GPRS PDP Context State Models related to the Attach/Detach State Model for the GPRS session. There is at most one GPRS Attach/Detach State Model per non idle GPRS session in one SGSN and at most one PDP Context State Model per active GPRS PDP context in one SGSN. The various PDP Context State Models are treated independently of each other.
The GPRS dialogue and the relationship between the GPRS Attach/Detach State Model and the gsmSCF are always initiated using the TDPs of the GPRS Attach/Detach State Model.
The gsmSCf requests further control or monitoring of individual GPRS PDP contexts using the Request Report GPRS Event information flow. To be informed about new individual PDP contexts the gsmSCF arms the DP 'PDP Context Establishment' or the DP 'PDP Context Establishment Acknowledgement' generically, i.e. without a PDP ID, as an EDP. To be informed about the handed over PDP contexts the gsmSCF arms the DP 'Change of Position Context' generically as an EDP-N or EDP-R.
Each GPRS PDP context is identified by a PDP ID. The PDP ID is assigned by the SGSN during PDP context establishment. The PDP ID is unique within one GPRS dialogue. The Request Report GPRS Event information flows to control new or handed over PDP contexts do not include a PDP ID. There is no 'PDP ID' related to the GPRS Attach/Detach State Model.
The PDP Id is reported to the gsmSCF in the first event notification for that PDP context.

6.4.4.2 GPRS CAMEL Scenario 2

Scenario 2 allows CAMEL control of single PDP contexts. Multiple PDP contexts are controlled in this scenario via multiple GPRS dialogues (PDP Context dialogues).

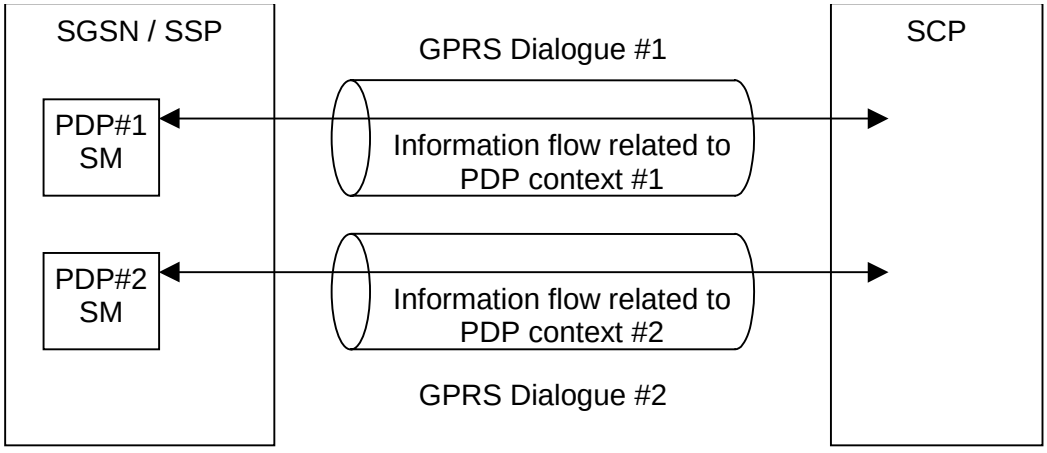

Figure 6.6: GPRS CAMEL Scenario 2

A GPRS dialogue in scenario 2 consists of a single GPRS PDP Context State Model. There is no GPRS Attach/Detach State Model involved in this scenario. There is at most one PDP Context State Model per active GPRS PDP context in one SGSN.
There might be multiple GPRS dialogues in scenarios 2 for one GPRS session, each of the dialogues controlling a single GPRS PDP context. The various GPRS dialogues are independent of each other.
The GPRS dialogue and the relationship between the GPRS PDP Context State Model and the gsmSCF are always initiated using the TDPs for the GPRS PDP Context State Model.

Control of further individual GPRS PDP contexts in the same GPRS dialogue as in scenario 1 is not possible. There are no PDP IDs in this scenario.

6.4.5 SGSN Routeing Area Update

6.4.5.1 Intra-SGSN Routeing Area Update

Intra-SGSN Routeing Area Update will be detected via the DP 'Change of Position GPRS Session' for the session using the GPRS Attach/Detach State Model and via the DPs 'Change of Position Context' for the individual PDP contexts using the GPRS PDP Context State Models.
It will be reported via an EDP-N if the necessary EDP-N is armed.

6.4.5.2 Inter-SGSN Routeing Area Update

Inter-SGSN Routeing Area Update from the old SGSN to the new SGSN will be detected via the DP 'Change of Position GPRS Session' for the session using the GPRS Attach/Detach State Model and via the DPs 'Change of Position Context' using the GPRS PDP Context State Models for the individual PDP contexts which have been handed over.
Scenario 1:
Inter-SGSN Routeing Area Update from the old SGSN to the new SGSN will be detected in the new SGSN via the DP 'Change of Position GPRS Session' for the session using the GPRS Attach/Detach State Model and in the new SGSN via the DPs 'Change of Position Context' using the GPRS PDP Context State Models for the individual PDP contexts which have been handed over.
In this scenario the DP 'Change of Position GPRS Session' is armed as a TDP-R. If the Routeing Area Update is accepted the gprsSSF reports this TDP-R to the gsmSCF using the Initial DP GPRS information flow. To be informed about new PDP contexts the gsmSCF arms the DP 'PDP Context Establishment' or the DP 'PDP Context Establishment Acknowledgement' generically as EDP-R or EDP-N. The DPs 'Change of Position Context' for the PDP contexts which have been handed over will be reported with all necessary information to the gsmSCF when the gprsSSF is continued, i.e. it is not longer waiting for instructions. Contexts which are not continued in the new SGSN are not reported. The EDPs for new PDP contexts are reported as usual.
The Detach in the old SGSN is reported to the gsmSCF, provided this event is armed. All outstanding reports in the old SGSN are sent to the gsmSCF and all open CDRs are closed.
Scenario 2:
Inter-SGSN Routeing Area Update from the old SGSN to the new SGSN will be detected in the new SGSN via the DPs 'Change of Position Context' using the GPRS PDP Context State Models for the individual PDP contexts which have been handed over.
In this scenario the DP 'Change of Position Context' is armed as TDP-R. If the the Routeing Area Update is accepted the gprsSSF reports these TDP-Rs PDP contexts which have been handed over to the gsmSCF using the Initial DP GPRS information flows in mutltiple GPRS dialogues.
The PDP Context Disconnection in the old SGSN is reported to the gsmSCF, provided this event is armed. All outstanding reports in the old SGSN are sent to the gsmSCF and the open CDR is closed.

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Tdoc N2-000645

CR-Form-v3

CHANGE REQUEST

⌘ **23.078** **CR** **255** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

*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 ☒

Title:	⌘	Introduction of GGSN Address
Source:	⌘	T-Mobil
Work item code:	⌘	CAMEL3
Date:	⌘	14-Nov-00
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	The Charging ID is only unique together with the Address of the corresponding GGSN. The CAP 3 operations Initial DP GPRS and Event Report GPRS contain the charging ID but not the GGSN Address.
Summary of change:	⌘	The GGSN Address is introduced for the Initial DP GPRS and for the "Change Of Position PDP Context" and "PDP Context Establishment Acknowledge" of the Event Report GPRS.
Consequences if not approved:	⌘	The gsmSCF can not uniquely identify a PDP context by its charging ID. Correlation of PDP contexts with its corresponding CDRs is not possible. ☹

Clauses affected:	⌘	6.6.1.4.2; 6.6.1.5.2		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	22.078, 29.078, 29.002
Other comments:	⌘			

6.6.1.4 Event Report GPRS

6.6.1.4.1 Description

This IF is used to notify the gsmSCF of a GPRS event (e.g. Attach or Detach) previously requested by the gsmSCF in a Request Report GPRS Event IF.

6.6.1.4.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Gprs Reference Number	C	This IE consists of a number assigned by the gprsSSF and a number assigned by the gsmSCF. It is used for TCAP dialogue segmentation. Refer to 3GPP TS 29.078 [5] for the usage of this element.
GPRS Event type	M	This IE specifies the type of event that is reported.
Misc GPRS Info	M	This IE indicates the DP type (EDP-N or EDP-R).
GPRS Event Specific Information	M	This IE contains information specific to the reported event.
PDP ID	C	This IE identifies the PDP context, which the Report GPRS Event is applicable for. If not present the dialogue corresponds to the Attach/Detach State Model or to one single PDP context.

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

If the *GPRS Event type* contains DP Change of Position GPRS Session, then the GPRS Event Specific Information IE contains the following information elements:

Information element name	Required	Description
Location Information in SGSN	M	See subclause 7.6.1.2.2.

M Mandatory (The IE shall always be sent).

If the *GPRS Event type* contains DP Change of Position Context, then the GPRS Event Specific Information IE contains the following information elements:

Information element name	Required	Description
Access Point Name	C1	This IE identifies the address Access Point Name to which the MS is connected.
Charging ID	C1	This IE contains the Charging ID received from the GGSN for the PDP context.
Location Information in SGSN	M	See subclause 7.6.1.2.2.
PDP Type	C1	This IE identifies the PDP Type. See 3GPP TS 23.060 [11].
Quality Of Service	C1	This IE is described in the table below.
Time and Time Zone	C1	This IE contains the time that the gprsSSF met the detection point, and the time zone the gprsSSF resides in.
GGSN Address	C1	This IE contains the Address of the GGSN to which the MS is connected, see 3GPP TS 23.003.

M Mandatory (The IE shall always be sent).

C1 Conditional (The IE shall be sent, if available at inter-SGSN routing area update. Shall not be sent at intra-SGSN routing area update).

If the *GPRS Event type* contains DP Detach or DP PDP context disconnection, then the GPRS Event Specific Information IE contains the following information elements:

Information element name	Required	Description
Initiating Entity	M	This IE identifies the entity that has initiated the disconnection or detachment.

M Mandatory (The IE shall always be sent).

If the *GPRS Event type* contains DP PDP context establishment, then the GPRS Event Specific Information IE contains the following information elements:

Information element name	Required	Description
Access Point Name	M	This IE identifies the address Access Point Name the MS has requested to connect to.
PDP Type	M	This IE identifies the PDP Type. See 3GPP TS 23.060.
Quality Of Service	M	This IE is described in the table below.
Location Information in SGSN	M	See subclause 7.6.1.2.2.
Time and Time Zone	M	This IE contains the time that the gprsSSF met the detection point, and the time zone the gprsSSF resides in.
PDP Initiation Type	M	This IE indicates whether a PDP context was established as a result of a network-initiated request or as a result of a subscriber request.

M Mandatory (The IE shall always be sent).

If the *GPRS Event type* contains DP PDP context establishment acknowledgement, then the GPRS Event Specific Information IE contains the following information elements:

Information element name	Required	Description
Access Point Name	M	This IE identifies the address Access Point Name to which the MS is connected.
Charging ID	M	This IE contains the Charging ID received from the GGSN for the PDP context.
PDP Type	M	This IE identifies the PDP Type. See 3GPP TS 23.060.
Quality Of Service	M	This IE is described in the table below.
Location Information in SGSN	M	See subclause 7.6.1.2.2.
Time and Time Zone	M	This IE contains the time that the gprsSSF met the detection point, and the time zone the gprsSSF resides in.
GGSN Address	M	This IE contains the Address of the GGSN to which the MS is connected, see 3GPP TS 23.003.

M Mandatory (The IE shall always be sent).

6.6.1.5 Initial DP GPRS

6.6.1.5.1 Description

This IF is generated by the gprsSSF when a trigger is detected at a DP in the GPRS state models, to request instructions from the gsmSCF.

6.6.1.5.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Gprs Reference Number	M	This IE consists of a number assigned by the gprsSSF. It is used for TCAP dialogue segmentation. Refer to 3GPP TS 29.078 [5] for the usage of this element.
ServiceKey	M	This IE indicates to the gsmSCF the requested CAMEL Service. It is used to address the required application/SLP within the gsmSCF.
GPRS Event Type	M	This IE indicates the armed GPRS DP event resulting in the Initial Data Event IF.
MSISDN	M	This IE contains the basic MSISDN of the MS.
IMSI	M	This IE identifies the mobile subscriber.
Time and Time zone	M	This IE contains the time that the gprsSSF was triggered, and the time zone the gprsSSF resides in.
GPRS MS Class	C	This IE contains the MS network and radio access capabilities.
PDP Type	C	This IE identifies the PDP Type, e.g. X.25 or IP.
Quality of Service	C	This IE is described in the table below.
Access Point Name	C	This IE identifies the address Access Point Name the MS has requested to connect to.
Routeing Area Identity	C	This IE contains the location information of the MS.
Charging ID	C	This IE contains the Charging ID received from the GGSN for the PDP context.
SGSN Capabilities	C	This IE specifies the capabilities of the SGSN node to support the CAMEL interwork, e.g. support of Advice of Charge.
Location Information in SGSN	M	This IE is described in the subclause 7.6.1.3.2.
PDP Initiation Type	M	This IE indicates whether a PDP context was established as a result of a network-initiated request or as a result of a subscriber request.
GGSN Address	C	This IE contains the Address of the GGSN to which the MS is connected, see 3GPP TS 23.003.

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

Quality of Service contains the following information elements:

Information element name	Required	Description
Requested QoS	C	This IE identifies the QoS requested by the subscriber for a new PDP Context. It shall be included if the InitialDPGPRS is sent at PDP Context Establishment, at PDP Context Establishment Acknowledgement and at Change of Position Context.
Subscribed QoS	C	This IE identifies the subscribed QoS. It shall be included if the InitialDPGPRS is sent at PDP Context Establishment, at PDP Context Establishment Acknowledgement and at Change of Position Context.
Negotiated QoS	C	This IE identifies the QoS which was negotiated between the user, the SGSN and the GGSN. It shall be included if the InitialDPGPRS is sent at PDP Context Establishment Acknowledgement and at Change of Position Context.

C Conditional (The IE shall be sent, if available)

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e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.078	CR	249r2	Current Version:	3.6.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-CN#10 *list expected approval meeting # here ↑*

for approval [ ]
for information [ ]

strategic [ ]
non-strategic [ ]
(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: Siemens **Date:** 15/11/2000

Subject: Error handling in ATSI

Work item: CAMEL Phase 3

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: CR 23.078-228r3 (N2-000550) provides clear description of ATSI, i.e. not only one data can be requested. However, if one of the requested data is not available, the negative response would be returned no matter other data are available.
To prevent such situation, this CR proposes to return the available data in the normal response, and the negative response be only in the case where none of the requested data is available.

Clauses affected: 10

Other specs affected:

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

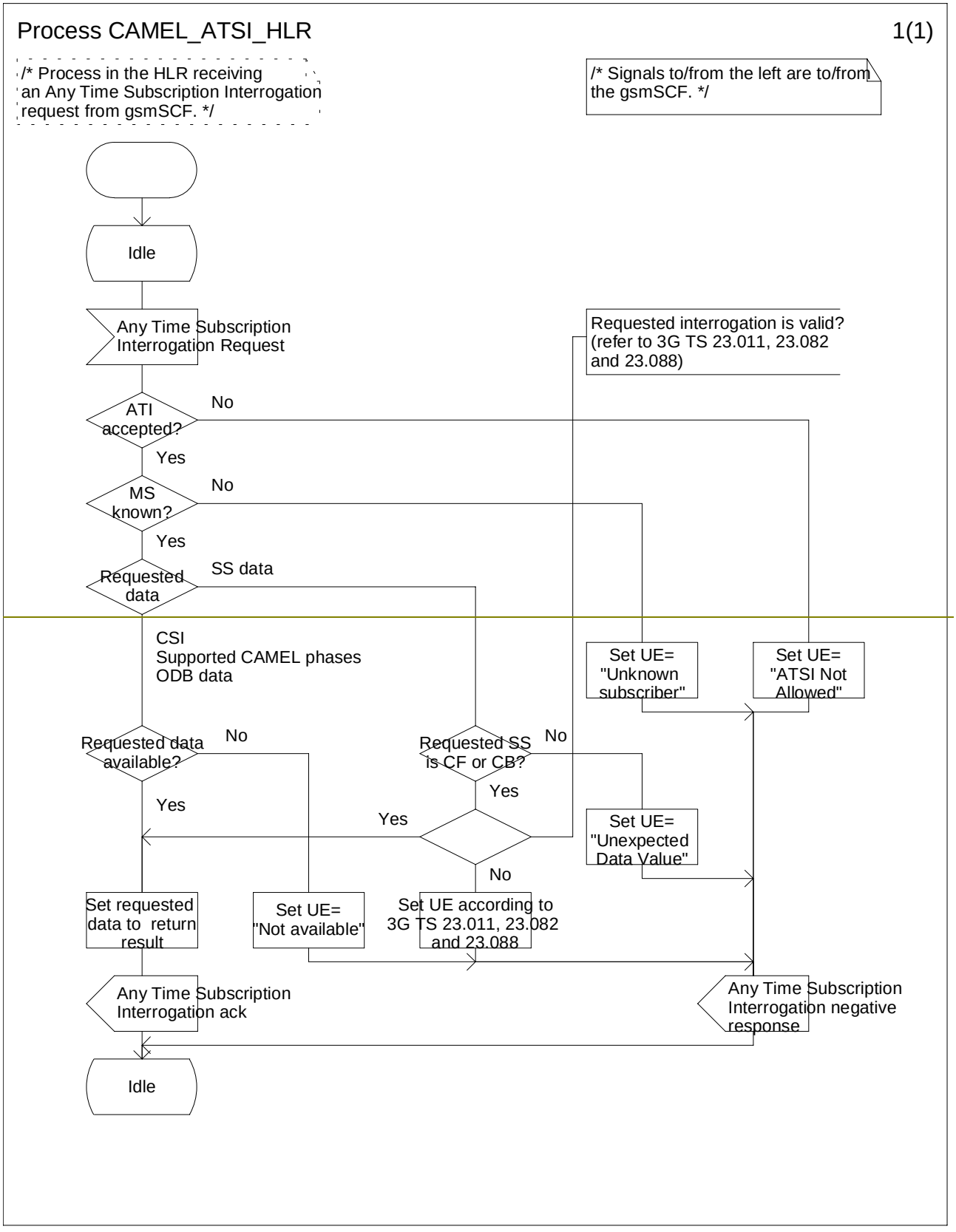
Other comments: This CR overwrites the SDL proposed by CR 23.078-228r3 (N2-000550).

10.2.1 Any Time Subscription Interrogation

Handling of Any Time Interrogation for Subscription Information Retrieval involves the following process:

- CAMEL_ATSI_HLR.

If an OSS needs the Subscription Information, the gsmSCF initiates a transaction to the HLR by sending an Any Time Subscription Interrogation Request.


Process CAMEL_ATSI_HLR
1(1)
/* Process in the HLR receiving an Any Time Subscription Interrogation request from gsmSCF. */
/* Signals to/from the left are to/from the gsmSCF. */
Idle
Any Time Subscription Interrogation Request
Requested interrogation is valid? (refer to 3G TS 23.011, 23.082 and 23.088)
ATI accepted?
No
Yes
MS known?
No
Yes
Requested data
SS data
CSI
Supported CAMEL phases
ODB data
Set UE= "Unknown subscriber"
Set UE= "ATSI Not Allowed"
Requested data available?
No
Yes
Requested SS is CF or CB?
No
Yes
Yes
Set UE= "Unexpected Data Value"
No
Set requested data to return result
Set UE= "Not available"
Set UE according to 3G TS 23.011, 23.082 and 23.088
Any Time Subscription Interrogation ack
Any Time Subscription Interrogation negative response
Idle

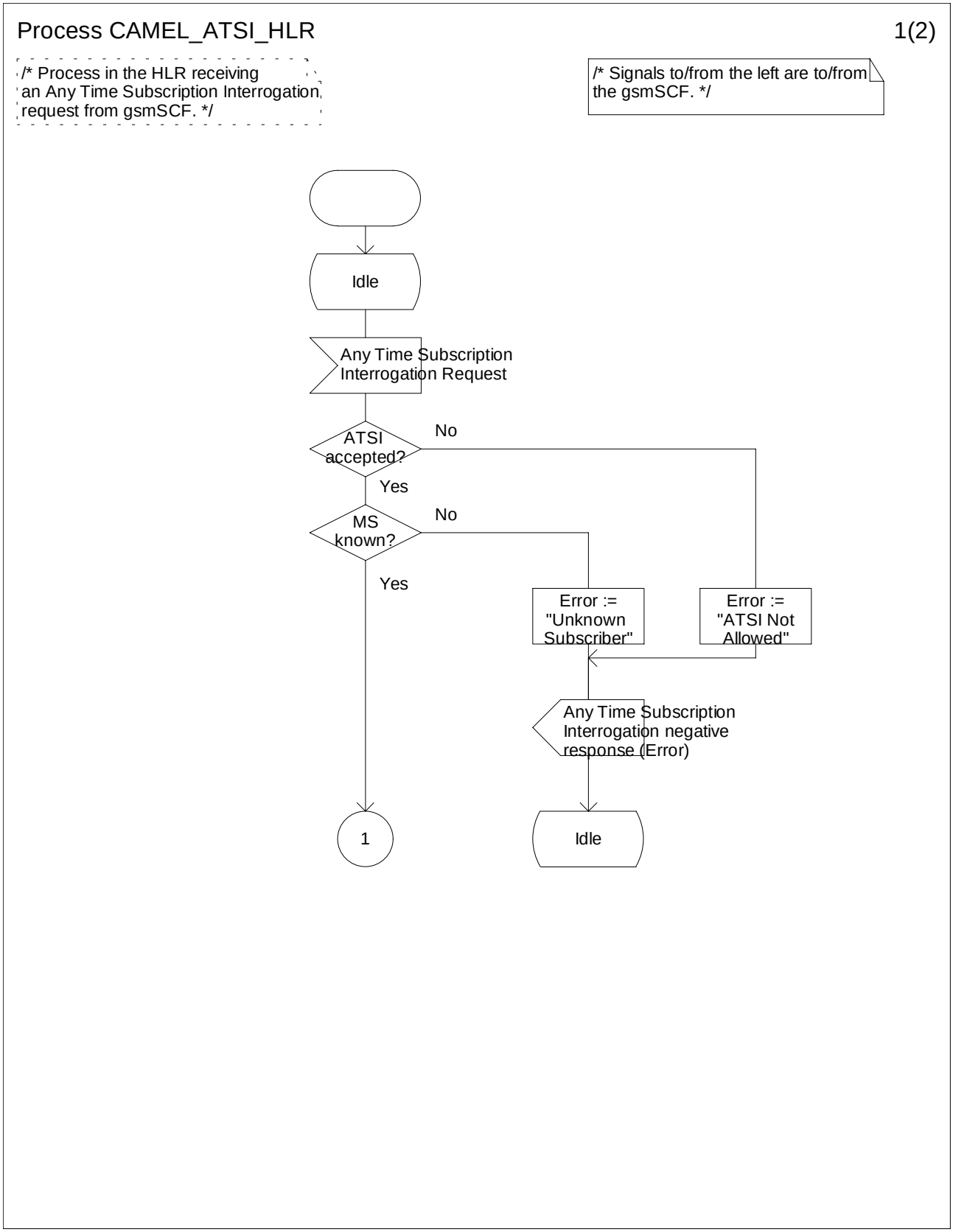


Figure 10.2a: Process CAMEL_ATSI_HLR (sheet 1)

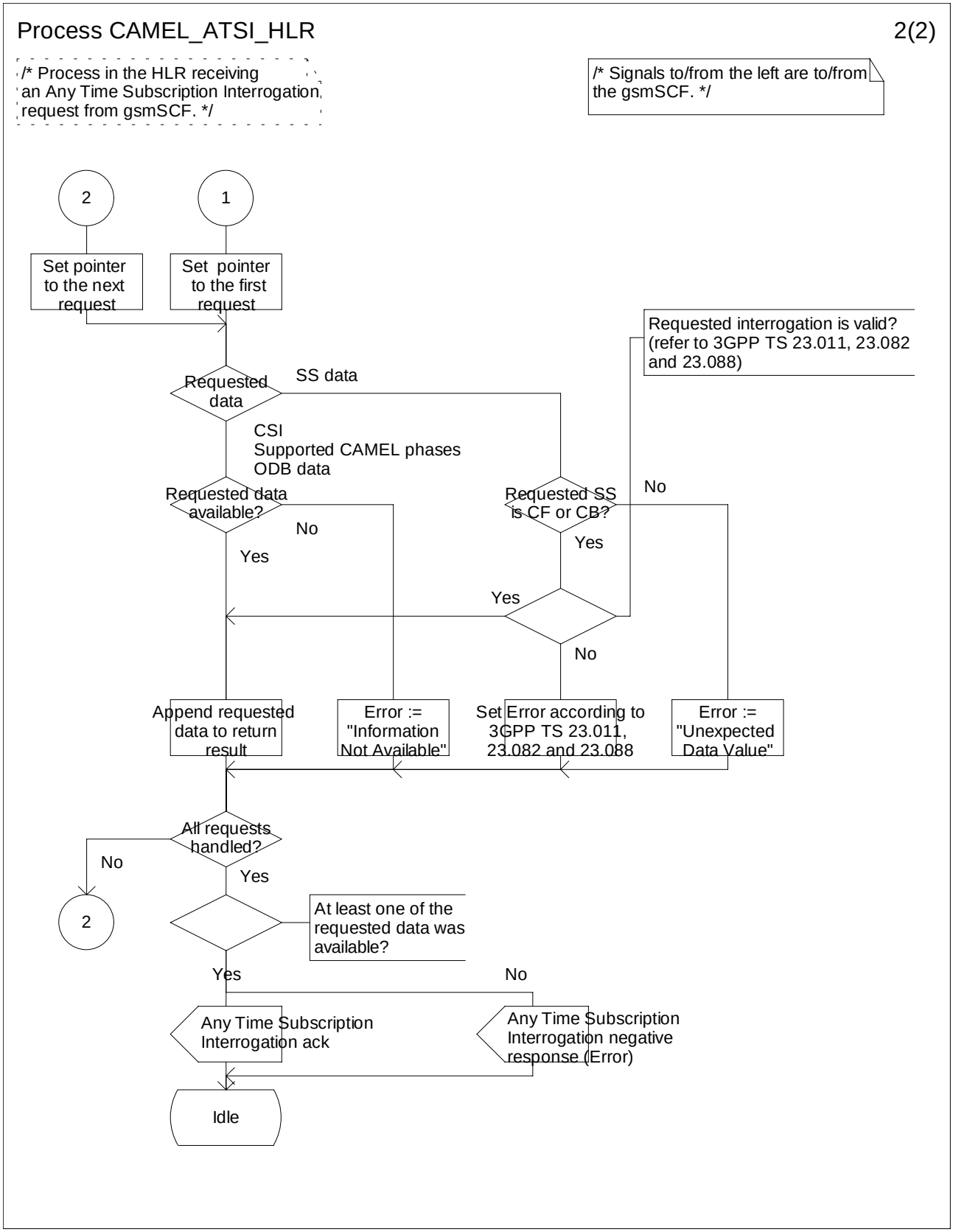


Figure 10.2b: Process CAMEL_ATSI_HLR (sheet 2) (NEW FIGURE)

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Document N2-000673
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or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.078	CR	248r2	Current Version:	3.6.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-CN#10 *list expected approval meeting # here ↑*

for approval [ ]
for information [ ]

strategic [ ]
non-strategic [ ]
(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: Siemens **Date:** 15/11/2000

Subject: Improved description of the location information in SGSN

Work item: CAMEL Phase 3

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

- Current description of the location information IE may cause confusion. Location Area ID and Routeing Area ID shall contain only one information listed in the table. However, they contain themselves in the description.
- Further, since LocationInformationSGSN in 29.078 is defined with routeingAreaIdentity as independent from cellGlobalIdOrServiceAreaIdOrLAI, there is no reason to limit that only one of routeing area id, cell id, service area id or lai shall be sent.
- The further improvement is necessary for better readability.

Clauses affected: 4 (SRI ack), 7 (IDP SMS), 6 (Initial DP GPRS), 9 (Mobility Managenemt event Notification) and 11 (ATI ack)

Other specs affected:

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

***** First modified part in 4 *****

4.6.9.1 Send Routeing Info ack

4.6.9.1.1 Description

This IF is specified in 3GPP TS 23.018 [3] and is used by the HLR to transfer the requested routeing information to the GMSC.

4.6.9.1.2 Information Elements

Send Routeing Info ack contains the following CAMEL specific IE:

Information element name	Required	Description
Location Information	C	This IE indicates the location of the served subscriber.
O-CSI	C	This IE identifies the subscriber as having originating CAMEL services. Shall be sent if O-CSI is active, and CFU or CFNRc has been invoked, or if both O-CSI and T-CSI are active.
D-CSI	C	This IE identifies the subscriber as having originating CAMEL dialled services. Shall be sent if D-CSI is active, and CFU or CFNRc has been invoked, or if both D-CSI and T-CSI are active.
Subscriber State	C	This IE indicates the status of the MS. The possible values of the IE are: - CAMELBusy: The VLR has indicated that the MS is engaged on a transaction for a mobile originating or terminated circuit-switched call. - NetworkDeterminedNotReachable: The VLR has indicated that the network can determine from its internal data that the MS is not reachable. - AssumedIdle: The VLR has indicated that the state of the MS is neither "CAMELBusy" nor "NetworkDeterminedNotReachable". - NotProvidedFromVLR: The VLR did not provide any information on subscriber state even though it was requested.
T-CSI	C	This IE identifies the subscriber as having terminating CAMEL services. Shall be sent if T-CSI is active and no Suppress T-CSI indicator is present in the SRI.
Basic Service Code	C	This IE indicates the type of basic service i.e., teleservice or bearer service.
CUG Subscription Flag	C	This IE indicates if the called party has a CUG subscription. It shall only be sent if the T-CSI is active and included in the Send Routing Information ack.

C Conditional (The IE shall be sent, if available).

Location Information contains is defined in 3GPP TS 23.018. The following differences apply:

Information element name	Required	Description
Service area ID	C1	See 3GPP TS 23.018 [3].
Cell ID	C1	See 3GPP TS 23.018 [3].
Current Location Retrieved	-	Not applicable
Location area ID	C1	See 3GPP TS 23.003 [37]. ~~Only one of the following conditional IEs shall be sent:~~ ~~- Cell ID~~ ~~- Service area ID~~ ~~- Location area ID~~
Selected LSA Identity	C	This IE indicates the LSA identity associated with the current position of the MS. Shall be present if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA ID with the highest priority shall be sent. See 3GPP TS 23.073 [23].

C Conditional (The IE shall be sent, if available and SoLSA is supported).

C1 Conditional (The IE shall be sent, if available. One and only one of the three conditional IEs shall be sent).

- Not applicable

O-CSI is defined in subclause 4.3.1.

D-CSI is defined in subclause 4.3.2.

T-CSI contains the following information:

Information element name	Required	Description
gsmSCF Address	M	This IE is described in subclause 4.3.3.
Service Key	M	This IE is described in subclause 4.3.3.
Default Call Handling	M	This IE is described in subclause 4.3.3.
TDP List	M	This IE is described in subclause 4.3.3.
CAMEL Capability Handling	C	This IE is described in subclause 4.3.3. If this IE is absent, this indicates that CAMEL phase 1 is asked.

M Mandatory.

C Conditional.

***** Next modified part in 7 *****

6.6.1.5 Initial DP GPRS

6.6.1.5.1 Description

This IF is generated by the gprsSSF when a trigger is detected at a DP in the GPRS state models, to request instructions from the gsmSCF.

6.6.1.5.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Gprs Reference Number	M	This IE consists of a number assigned by the gprsSSF. It is used for TCAP dialogue segmentation. Refer to 3GPP TS 29.078 [5] for the usage of this element.
ServiceKey	M	This IE indicates to the gsmSCF the requested CAMEL Service. It is used to address the required application/SLP within the gsmSCF.
GPRS Event Type	M	This IE indicates the armed GPRS DP event resulting in the Initial Data Event IF.
MSISDN	M	This IE contains the basic MSISDN of the MS.
IMSI	M	This IE identifies the mobile subscriber.
Time and Time zone	M	This IE contains the time that the gprsSSF was triggered, and the time zone the gprsSSF resides in.
GPRS MS Class	C	This IE contains the MS network and radio access capabilities.
PDP Type	C	This IE identifies the PDP Type, e.g. X.25 or IP.
Quality of Service	C	This IE is described in the table below.
Access Point Name	C	This IE identifies the address Access Point Name the MS has requested to connect to.
Routeing Area Identity	C	This IE contains the location information of the MS.
Charging ID	C	This IE contains the Charging ID received from the GGSN for the PDP context.
SGSN Capabilities	C	This IE specifies the capabilities of the SGSN node to support the CAMEL interwork, e.g. support of Advice of Charge.
Location Information in SGSN	M	This IE is described in the subclause 7.6.1.~~3~~2.2.
PDP Initiation Type	M	This IE indicates whether a PDP context was established as a result of a network-initiated request or as a result of a subscriber request.

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

***** Next modified part in 7 *****

7.6.1.2 Initial DP SMS

7.6.1.2.1 Description

This IF is generated by the gsmSSF/gprsSSF when a trigger is detected at a DP in the state model, to request instructions from the gsmSCF.

7.6.1.2.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Destination Subscriber Number	M	This IE contains a number to identify the Destination short message entity. The Destination Subscriber Number shall be retrieved from the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU, which are specified in 3GPP TS 23.040 [21].
Calling Party Number	M	This IE carries the MSISDN of the subscriber who sent the short message.
Event Type	M	This IE indicates the armed event (i.e., *SMS_Collected_Info*) resulting in the Initial DP SMS IF.
IMSI	M	This IE identifies the mobile subscriber.
Location Information in MSC	C	This IE is described in a table below.
Location Information in SGSN	C	This IE is described in a table below.
Service Key	M	This IE indicates to the gsmSCF the requested CAMEL Service. It is used to address the required application/SLP within the gsmSCF.
Time And Timezone	M	This IE contains the time that the gsmSSF/gprsSSF was triggered, and the time zone the gsmSSF/gprsSSF resides in.
TP Short Message Submission Specific Information	M	This IE contains the 1st octect of the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU, which are specified in 3GPP TS 23.040 [21]. For the SMS-SUBMIT TPDU, the 1st octet contains the following information: - Message Type Indicator - Reject Duplicates - Validity Period Format - Status Report Request - User Data Header Indicator - Reply Path For the SMS-COMMAND TPDU, the 1st octet contains the following information: - Message Type Indicator - User Data Header Indicator - Status Report Request Refer to 3GPP TS 23.040 [21] for an indication of which elements of this 1st octet are Mandatory and which elements are Conditional.
TP Protocol Identifier	M	This IE indicates the protocol used above SM-Transfer Layer. The TP Protocol Identifier shall be retrieved from the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU, which are specified in 3GPP TS 23.040 [21].
TP Data Coding Scheme	M	This IE indicates the data coding scheme of the TP-User Data field, and may indicate a message class. The message class may indicate e.g. the originator of the Short Message. The TP Data Coding Scheme shall be retrieved from the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU, which are specified in 3GPP TS 23.040 [21].
TP Validity Period	C	This IE indicates the length of the validity period or the absolute time of the validity period termination. This IE is only used for the SMS-SUBMIT TPDU. The TP Validity Period shall be retrieved from the SMS-SUBMIT TPDU which is specified in 3GPP TS 23.040 [21].
SMSC Address	M	This IE defines the address of the SMSC to which the MO short message is intended to be submitted.

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

Location Information in MSC is based on the Location Information IE defined in 3GPP TS 23.018. The following differences apply:

Information element name	Required	Description
Location number	-	Not applicable
VLR number	M	See 3GPP TS 23.018 [3].
Age of location information	-	Not applicable
Current Location Retrieved	-	Not applicable
Selected LSA Identity	C1	This IE indicates the LSA identity associated with the current position of the MS. Shall be sent if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA ID with the highest priority shall be sent. See 3GPP TS 23.073 [23].

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

C1 Conditional (The IE shall be sent, if available and SoLSA is supported).

- Not applicable

Location Information in SGSN is based on the Location Information IE defined in 3GPP TS 23.018. The following differences apply:

Information element name	Required	Description
Location number	-	Not applicable
Service area ID	C1	See 3GPP TS 23.018 [3].
Cell ID	C1	See 3GPP TS 23.018 [3].
Location area ID	C1	See 3GPP TS 23.018 [3].
Routeing area ID	C	See 3GPP TS 23.003 [37]. ~~Only one of the following conditional IEs shall be sent:~~ ~~- Cell ID~~ ~~- Service area ID~~ ~~- Routeing area ID~~
Geographical information	C	See 3GPP TS 23.032 [34].
Geodetic information	-	Not applicable
VLR number	-	Not applicable
Age of location information	-	Not applicable
Current Location Retrieved	-	Not applicable
~~Location area ID~~	~~C~~	~~Not applicable~~
SGSN number	M	Global Title of the Serving GPRS Service Node. See 3GPP TS 23.060 [11].
~~Age of location information~~	~~-~~	~~Not applicable~~
Selected LSA Identity	~~C1~~C2	This IE indicates the LSA identity associated with the current position of the MS. Shall be sent if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA ID with the highest priority shall be sent. See 3GPP TS 23.073 [23]

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

C1 Conditional (The IE shall be sent, if available. One and only one of the three conditional IEs shall be sent).

~~C1~~C2 Conditional (The IE shall be sent, if available and SoLSA is supported).

- Not applicable

***** Next modified part in 9 *****

9.4.1.1 Mobility Management event Notification

9.4.1.1.1 Description

This IF is generated by the VLR when it shall notify the gsmSCF of a Mobility Management event.

9.4.1.1.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Event Met	M	This IE indicates the type of Mobility Management that lead to the notification. The value of this IE shall be one of the following. - Location update in the same VLR service area - Location update to ananother VLR service area - IMSI attach - MS initiated IMSI detach (explicit detach) - Network initiated IMSI detach (implicit detach)
Service Key	M	This IE indicates the Service Logic that the gsmSCF shall apply.
IMSI	M	This IE identifies the mobile subscriber to whom the Mobility Event applies.
Basic MSISDN	M	This IE identifies the mobile subscriber to whom the Mobility Event applies.
Location Information	C	This IE indicates the current location of the MS. This IE is described in the next table.
Supported CAMEL Phases	M	This IE indicates the CAMEL Phases that are supported by the MSC/VLR in which the MS is registered after the mobility management event.

M Mandatory (The IE shall always be sent).

C Conditional (The IE shall be sent, if available).

Location Information is defined in 3GPP TS 23.018 [3]. The following differences apply:

Information element name	Required	Description
Service area ID	C1	See 3GPP TS 23.018 [3].
Cell ID	C1	See 3GPP TS 23.018 [3].
Current Location Retrieved	-	Not applicable
Location area ID	C1	See 3GPP TS 23.003 [37]. ~~Only one of the following conditional IEs shall be sent:~~ ~~- Cell ID~~ ~~- Service area ID~~ ~~- Location area ID~~
Selected LSA Identity	C	This IE indicates the LSA identity associated with the current position of the MS. Shall be sent if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA ID with the highest priority shall be sent. See 3GPP TS 23.073 [23].

C Conditional (The IE shall be sent, if available and SoLSA is supported).

C1 Conditional (The IE shall be sent, if available. One and only one of the three conditional IEs shall be sent).

- Not applicable

***** Next modified part in 11 *****

11.3.4.1 Any Time Interrogation ack

11.3.4.1.1 Description

This IF is used by the HLR to provide the requested subscriber location and/or subscriber state information to the gsmSCF.

11.3.4.1.2 Information Elements

The following information elements are required:

Information element name	Required	Description
Location Information	C	This IE indicates the location of the served subscriber.
Subscriber State	C	This IE indicates the status of the MS. The possible values of the IE are: - CAMELBusy: The VLR has indicated that the MS is engaged in a transaction for a mobile originating or terminated circuit-switched call. - NetworkDeterminedNotReachable: The VLR has indicated that the network can determine from its internal data that the MS is not reachable. - AssumedIdle: The VLR has indicated that the state of the MS is neither “CAMELBusy” nor “NetworkDeterminedNotReachable”. - NotProvidedFromVLR: The VLR did not provide any information on subscriber state even though it was requested.

C Conditional (The IE shall be sent, if requested and available).

Location Information is defined in 3GPP TS 23.018 [3]. The following differences apply:

Information element name	Required	Description
Service area ID	C1	See 3GPP TS 23.018 [3].
Cell ID	C1	See 3GPP TS 23.018 [3].
Location area ID	C1	See 3GPP TS 23.003 [37]. ~~Only one of the following conditional IEs shall be sent:~~ ~~- Cell ID~~ ~~- Service area ID~~ ~~- Location area ID~~
Selected LSA Identity	C	This IE indicates the LSA identity associated with the current position of the MS. Shall be sent if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA Id with the highest priority shall be sent. See 3GPP TS 23.073 [23].

C Conditional (The IE shall be sent, if available and SoLSA is supported).

C1 Conditional (The IE shall be sent, if available. One and only one of the three conditional IEs shall be sent).

3GPP TSG-CN WG2 Meeting #15
Paris, France, 13th – 17th November, 2000

***Document* N2-000685**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

23.078	CR	250r2	Current Version:	3.6.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-CN#10 *list expected approval meeting # here ↑*

for approval [ ]
for information [ ]

strategic [ ]
non-strategic [ ]
(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: Siemens **Date:** 21/11/2000

Subject: Additional clarification for ATM

Work item: CAMEL Phase 3

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Current description of Any Time Modification (ATM) would allow any modification by the SCP. However, CF and CB data being concerned, these data should be checked together so as not to conflict each other. The SCP shall not be able to modify these data to what can not be done by the subscriber using MS. This CR provides the text and SDL for the interaction check between CF and CB data before they are modified.

Clauses affected: 2, 10

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM 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: CR editor's note: Yellow-highlighted texts are only for information which were added since the last CR (23.078-250r1 N2-000633). Actual implementation should be done without highlight.

***** First modified part *****

2 References

.....

[x] 3GPP TS 23.015: "3rd Generation Partnership Project; Technical Specification Group Core Network; Technical realization of Operator Determined Barring (ODB)".

***** Next modified part *****

10.2.2 Any Time Modification

Handling of Any Time Modification involves the following process:

- CAMEL_ATM_HLR.

The following procedures are involved:

- ATM_Modify_Data
  This procedure checks which data shall be modified and calls the appropriate data modification procedure.

- ATM_Modify_CSI_Data
  If the CSI indicated in the ATM request is not available in the HLR, then an error is returned.
  Otherwise, the CSI state and/or Notification-to-CSE flag are set as instructed with the ATM request.

- ATM_Modify_CF_Data
  When only the SS-code and (optionally) a Basic Service code are present in the ATM request, then all Call Forwarding data belonging to this SS code and basic service code is erased.
  Otherwise, the behaviour is as follows:

  - If a valid SS state is present in the ATM request, then an SS state transition is performed.

  - If a valid FTN, FTN sub address or No Reply Condition Time is present in the ATM request, then the indicated variable is modified.

  - Before modification of CF data (SS state changed to 'registered', insert or change of FTN), the interaction checks between CF and ODB and between CF and CB shall be performed as described in 3GPP TS 23.015 [x] and 23.082 [27] respectively. The CF data shall only be modified if the changed new CF data would not conflict with the existing ODB or CB entries.

  - If an instruction to modifiy the notification-to-CSE flag is present in the ATM request, then the notification-to-CSE flag is modified.

- ATM_Modify_CB_Data
  When only the SS-code and (optionally) a Basic Service code are present in the ATM request, then all Call Barring data belonging to this SS code and basic service code is erased.
  Otherwise, the behaviour is as follows:

  - If a valid SS state is present in the ATM request, then an SS state transition is performed.

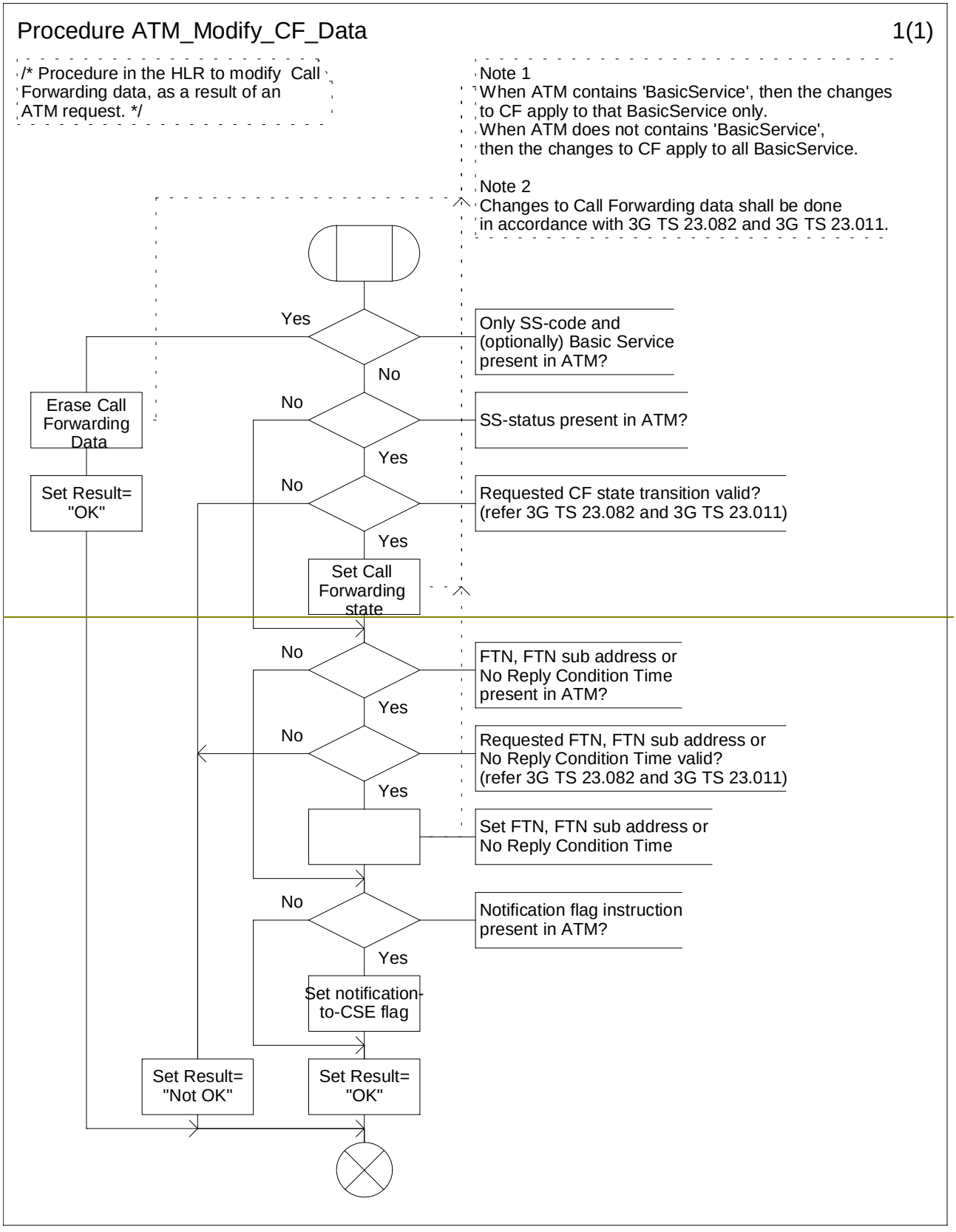
  - Before modification of CB data (SS state), the interaction checks between CF and CB shall be performed as described in 3GPP TS 23.088 [39]. The CB data shall only be modified if the changed new CB data would not conflict with the existing CF entries.

  - If a valid Password or 'Wrong password attempt counter' is present in the ATM request, then the indicated variable is modified.

- If an instruction to modifiy the notification-to-CSE flag is present in the ATM request, then the notification-to-CSE flag is modified.

After having executed the Any Time Modification instruction from the gsmSCF, the HLR calls the procedure CAMEL_NSDC_HLR, which sends notifications to gsmSCF(s), if required.

***** Next modified part *****


Procedure ATM_Modify_CF_Data
1(1)
/* Procedure in the HLR to modify Call Forwarding data, as a result of an ATM request. */
Note 1
When ATM contains 'BasicService', then the changes to CF apply to that BasicService only.
When ATM does not contains 'BasicService', then the changes to CF apply to all BasicService.
Note 2
Changes to Call Forwarding data shall be done in accordance with 3G TS 23.082 and 3G TS 23.011.
Yes
Only SS-code and (optionally) Basic Service present in ATM?
No
No
SS-status present in ATM?
Erase Call Forwarding Data
Yes
No
Requested CF state transition valid? (refer 3G TS 23.082 and 3G TS 23.011)
Set Result= "OK"
Yes
Set Call Forwarding state
No
FTN, FTN sub address or No Reply Condition Time present in ATM?
Yes
No
Requested FTN, FTN sub address or No Reply Condition Time valid? (refer 3G TS 23.082 and 3G TS 23.011)
Yes
Set FTN, FTN sub address or No Reply Condition Time
No
Notification flag instruction present in ATM?
Yes
Set notification-to-CSE flag
Set Result= "Not OK"
Set Result= "OK"

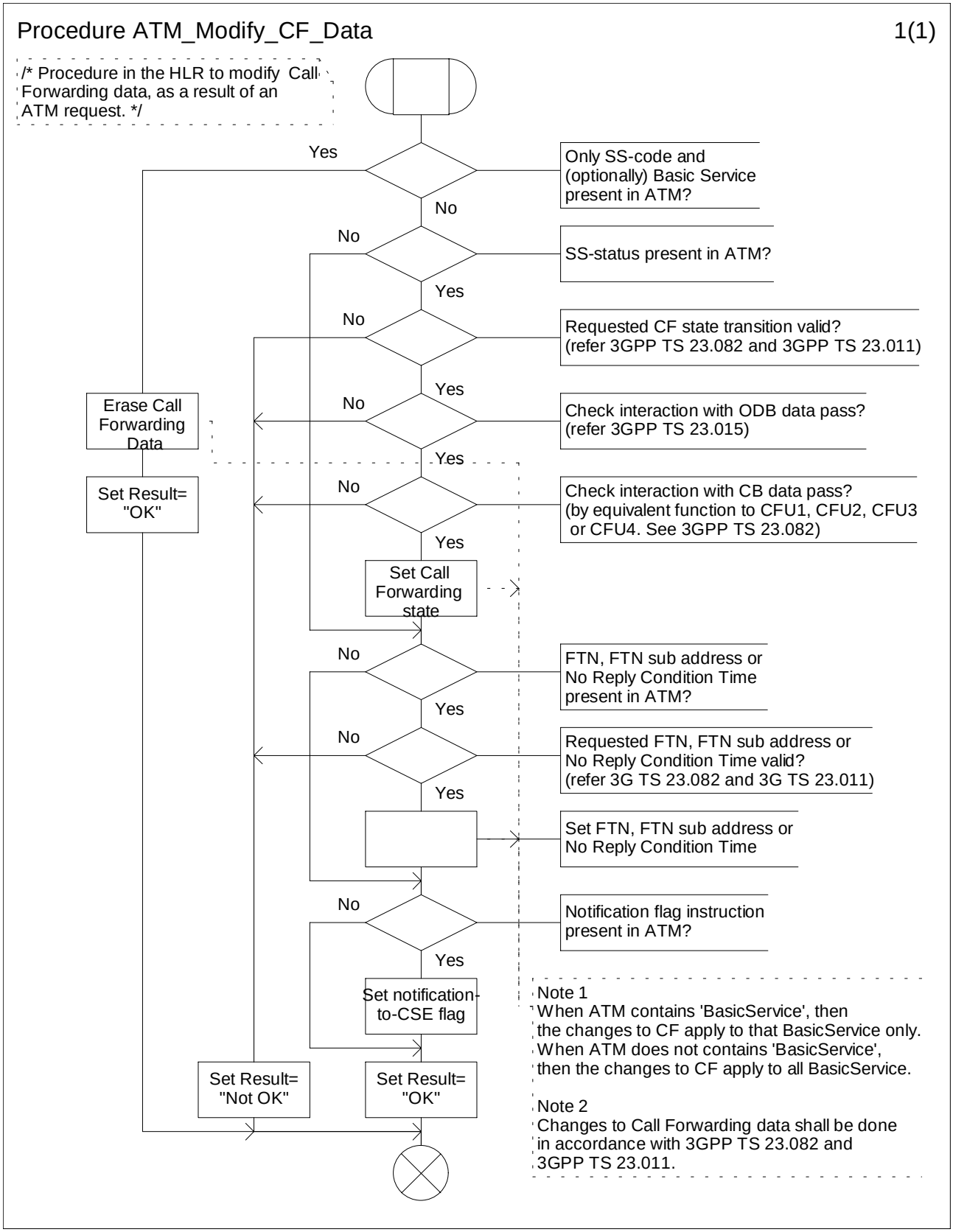
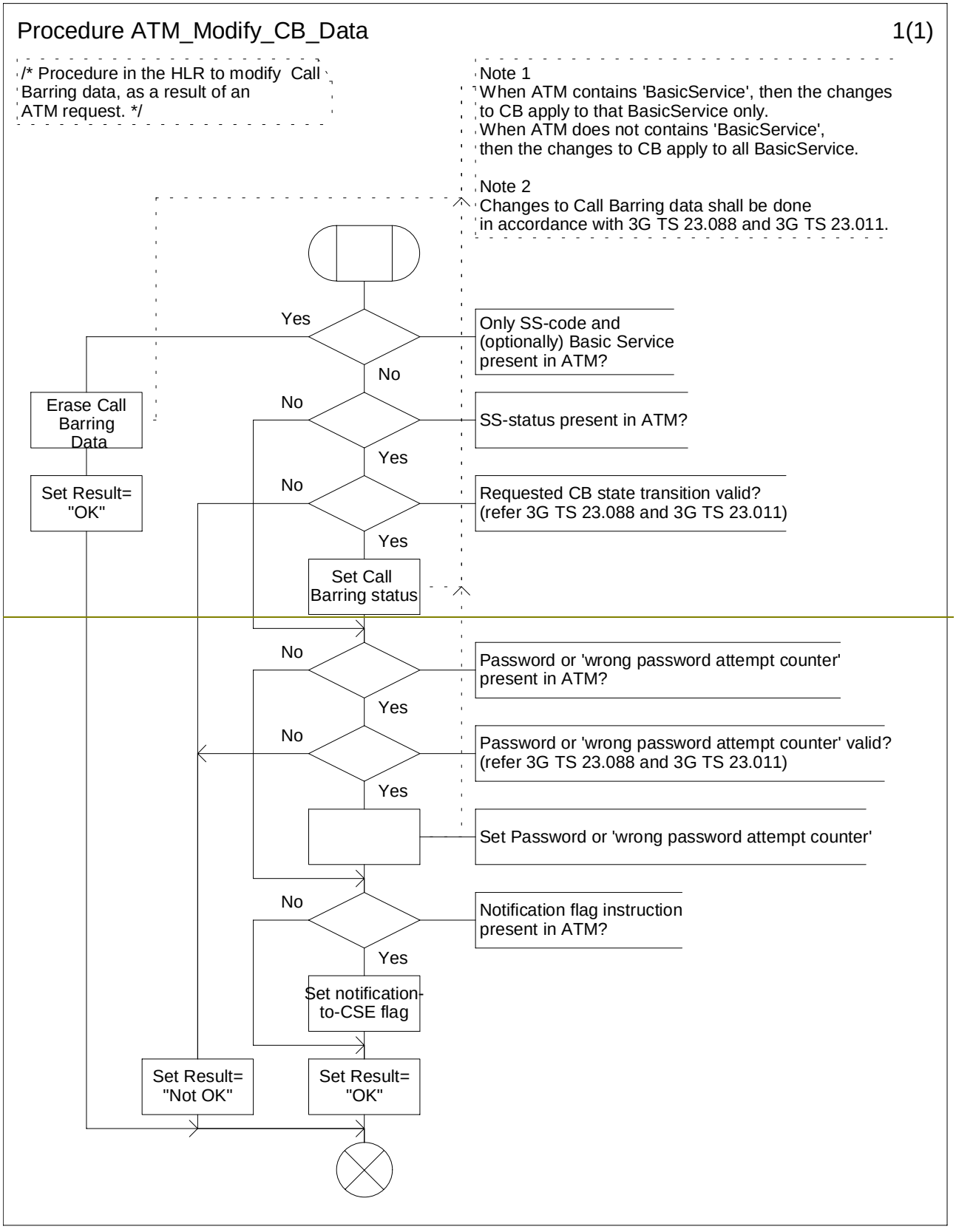


Figure 10.6: Procedure ATM_Modify_CF_Data (sheet 1)


Procedure ATM_Modify_CB_Data
1(1)
/* Procedure in the HLR to modify Call Barring data, as a result of an ATM request. */
Note 1
When ATM contains 'BasicService', then the changes to CB apply to that BasicService only.
When ATM does not contains 'BasicService', then the changes to CB apply to all BasicService.
Note 2
Changes to Call Barring data shall be done in accordance with 3G TS 23.088 and 3G TS 23.011.
Yes
Only SS-code and (optionally) Basic Service present in ATM?
No
No
SS-status present in ATM?
Erase Call Barring Data
Yes
No
Requested CB state transition valid? (refer 3G TS 23.088 and 3G TS 23.011)
Set Result= "OK"
Yes
Set Call Barring status
No
Password or 'wrong password attempt counter' present in ATM?
Yes
No
Password or 'wrong password attempt counter' valid? (refer 3G TS 23.088 and 3G TS 23.011)
Yes
Set Password or 'wrong password attempt counter'
No
Notification flag instruction present in ATM?
Yes
Set notification-to-CSE flag
Set Result= "Not OK"
Set Result= "OK"

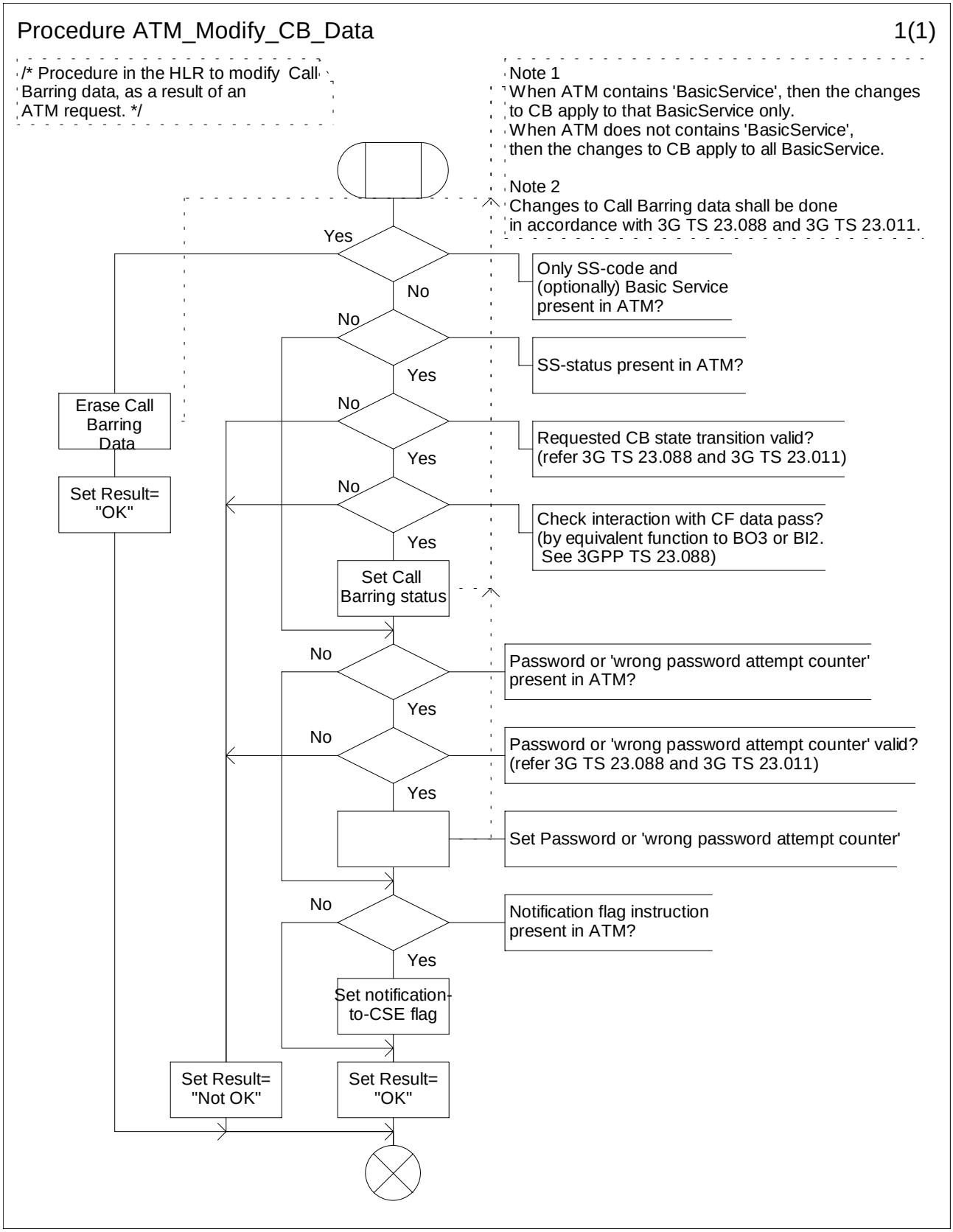


Figure 10.7: Procedure ATM_Modify_CB_Data (sheet 1)