



# End-to-End Functional Capability Specification for Inter-PLMN CAMEL-Roaming (CAMEL Phase 1, Phase 2 and Phase 3)

Version 3.3.3

13<sup>th</sup> October 2005

*This is a Non-binding Permanent Reference Document of the GSMA*

---

## Security Classification: Non- Confidential

Access to and distribution of this document is restricted to the persons permitted by the security classification. This document is confidential to the Association and is subject to copyright protection. This document is to be used only for the purposes for which it has been supplied and information contained in it must not be disclosed or in any other way made available, in whole or in part, to persons other than those permitted under the security classification without the prior written approval of the Association.

## Copyright Notice

Copyright © 2003 GSM Association

## Disclaimer

The GSM Association ("Association") makes no representation, warranty or undertaking (express or implied) with respect to and does not accept any responsibility for, and hereby disclaims liability for the accuracy or completeness or timeliness of the information contained in this document. The information contained in this document may be subject to change without prior notice.

## Antitrust Notice

The information contain herein is in full compliance with the GSM Association's antitrust compliance policy.

## Table of Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
1.1	Scope	4
	References	4
1.2	Objectives of Tests	5
1.3	Strategy for Testing	8
1.4	Service Logic	9
1.5	Prerequisites for testing	10
<b>2</b>	<b>Test Cases</b>	<b>11</b>
2.1	Camel Phase 1	12
2.1.1	Location Update	14
2.1.2	Check operation of IDP and CON	16
2.1.3	Check operation of PSI	18
2.1.4	Check reporting of EDP O_Answer and operation of RC	20
2.1.5	Check operation of CUE	22
2.1.6	Check Default Call Handling	24
2.1.7	Check Suppression Of Announcement	26
2.1.8	Interaction with GSM Supplementary Services and ODB	28
2.2	Camel Phase 2	33
2.2.1	Location Update	36
2.2.2	Check Operation of IDP and DP2 Criteria	38
2.2.3	Check operation of PSI	42
2.2.4	Check reporting of EDP O_Answer, O_Disconnect and operation of RC	44
2.2.5	Check operation of CUE and FCI with Follow-On Call	46
2.2.6	Check operation of CIReq, SCI and AC	50
2.2.7	Check operation of ETC and DFC	63
2.2.8	Check Default Call Handling	66
2.2.9	Check Suppression Of Announcement	68
2.2.10	Interaction with GSM Supplementary Services and ODB	70
2.3	CAMEL Phase 3	79
2.3.1	MO SMS Control	79
2.3.2	GPRS Control	94
2.3.3	Mobility Management	134
<b>3</b>	<b>Equipment Requirements</b>	<b>139</b>
3.1	General	139
3.2	User Equipment for CAMEL phase 1 tests	139
3.3	User Equipment for CAMEL phase 2 tests	140
3.4	User Equipment for CAMEL phase 3 tests	141
3.5	Test Equipment	143
<b>4</b>	<b>Pre-Testing Data Exchange</b>	<b>143</b>
4.1	Testing Contact Information	143
4.2	PLMN addressing, numbering and routing data	143
4.3	SIM associated data	143

4.4	Test Service associated data	144
<b>Annex A</b>		<b>145</b>
A.1	Protocol information flows and features reference list	145
A.2	Overview of CAMEL phase 1 Features	149
A.3	Overview of CAMEL phase 2 Features	150
A.4	Overview of CAMEL phase 3 Features (in addition to CAMEL phase 2)	152
A.5	Test Announcements	154
A.6	Test Numbers	154
A.7	Test APNs	155
<b>Annex B</b>	<b>Document Management</b>	<b>156</b>
B.1	Document History	156

# 1 Introduction

## 1.1 Scope

This document contains the specification of IREG End-to-end Functional Capability tests relating to the international roaming of a Mobile Station subscribed to CAMEL services, belonging to a home PLMN(a), to and within a visited PLMN(b).

The tests specified here do not replace the End-to-end Functional Capability tests for Inter-PLMN Roaming [see Stage 4: IREG PRD IR24], because not every roamer will be subscribed to a CAMEL service. This document represents rather an extension to the IR24 tests. The tests should be done after successful Stage 4 testing.

Whilst it is expected that CAMEL-roaming will be a bilateral activity between two PLMNs, please note that this document is written in an unidirectional context. Hence Roaming is taking place by a MS(a) to VPLMN(b) only. There is no reference to a Mobile Station MS(b) visiting PLMN(a) .

To complete IREG End-to-end Functional Capability tests for bilateral CAMEL roaming, it is necessary to perform the tests in this document twice: the second time the real identities of PLMN(a) and PLMN(b) are swapped.

IREG Document PRD IR.23 defines the scope and purpose of each stage of testing.

This document does not cover:

- SCCP testing [see Stage 2: IREG PRD IR25]
- Exchange of PLMN numbering, addressing and routing data [see Stage 3: IREG PRD IR23]
- Testing of Transferred Account Procedure, billing applications and any inter-PLMN financial statements; [see TADIG PRD TD06]. However the production of a Toll Ticketing file, for use in the TADIG Stage 3 testing is included.
- Definition of operation and maintenance procedures such as contact points for fault reporting and notification of planned works. [See Stage 3: IREG PRD IR23]
- IR24 International Roaming testing. [See Stage 4: IREG PRD IR24]
- OR aspects: it is assumed that the IMSC is always located in the HPLMN

The Scope of this issue of the document extends to CAMEL Phase 1 and Phase 2.

## References

Term	CAMEL Phase 1	CAMEL Phase 2	Description
GSM 02.78	V5.6.0	V6.3.0	"Customised Applications for Mobile network Enhanced Logic (CAMEL); Service definition – Stage 1"
GSM 03.78	V5.8.0	V6.4.1	"Customized Applications for Mobile network Enhanced Logic (CAMEL) – Stage 2"
GSM 09.78	V5.6.0	V6.4.0	"Customized Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification"
GSM 09.02	V5.9.0	V6.4.0	"Mobile Application Part (MAP) specification"

Term	CAMEL Phase 1	CAMEL Phase 2	Description
3GPP TS 22.078			"Customised Applications for Mobile network Enhanced Logic (CAMEL); Service description, Stage; (Release 1999)"
3GPP TS 23.078			"Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2; (Release 1999)"
3GPP TS 29.078			"Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3; CAMEL Application Part (CAP) specification;(Release 1999)"
3GPP TS 29.002			"Mobile Application Part (MAP) specification; (Release 1999)"

## 1.2 Objectives of Tests

The fundamental objective of this testing is to confirm the capability of CAMEL services which GSM users subscribed-to these services will receive when roaming from their Home PLMN(a) to PLMN(b). Consequently the tests are restricted to top-level capability testing. There is no provocative or inopportune behaviour testing.

Because the testing is at a top-level, its scope includes checking the correct working of CAMEL features. The term "CAMEL features" relate to CAMEL Phase 1 and Phase 2 through the document.

The overall objective of the tests is to confirm that the CAMEL features, which are known to operate correctly within each separate PLMN, will also operate correctly for Inter-PLMN roaming.

The specific objectives:

- "Location updating" and the associated "Inserting of Subscriber data" including O-CSI can be successfully completed for MS(a) roaming in PLMN(b).
- "Provide Subscriber Info" is successfully executed.
- Outgoing speech calls by MS(a) are handled for:
  - Calls to VPLMN(b) country (i.e. local calls)
  - International calls
- Encountered Event Detection Points are reported correctly.
- SCF is able to terminate calls.
- The default call handling described in O-CSI is correctly executed.
- Suppression of announcements in VMSC is successfully executed.
- Interworking with GSM SS and ODB is correctly executed.
- Specific objectives for CAMEL Phase 2
  - IDP Trigger Criteria are correctly executed.
  - Encountered Event Detection Points lead to successful Follow-On calls and reconnections, respectively.
  - Control of call duration, transmission of Advice Of Charge parameters and the report of specific information about a single call party are successfully executed.
  - The assist procedure to connect a roaming subscriber to an IN-announcement located in his HPLMN is successfully executed.
  - The operation of SS-CSI is correctly executed.

The following topics are not tested:

#### General topics

- Features regarding terminating CAMEL services are not tested, because they are not relevant in the roaming environment as long as optimal routing is not supported. SoA is an exception that is tested.
- Charging aspects are not specifically verified here. However TAP Records will be produced, which may be used to check charging procedures.

WARNING: CAMEL specific parameters will be included in TAP Records!

- "Any Time Interrogation" over network boundaries is not tested, because this requires specific agreements between the involved operators.
- Termination of call establishment via ReleaseCall is not tested to reduce expenditure.
- It is not tested, that in case an emergency call is requested, the SCF is not invoked. It is recommended to run this test during VPLMN internal tests.
- The ActivityTest information flow is not tested, because the initiation timers are SCP dependent.

#### Topics related to CAMEL Phase 1

- Provocative reconnection after a reported disconnect event is not tested. This is a scenario, which is not allowed in CAMEL Phase 1 and could lead to billing problems. It is recommended to run this test scenario during VPLMN internal tests.
- Reporting of disconnect events is not tested, because it is not possible to make this event visible to the tester without using a protocol analyser. However the ability to arm a disconnect event detection point is part of the tests.

#### Topics related to CAMEL Phase 2

IDP Trigger Criteria tests are restricted to the Destination-Number-Length criteria to reduce expenditure. The other Trigger Criteria are not tested.

- The following SRF information flows are not tested over network boundaries: CAP-ResetTimer, CAP-PromptAndCollectUserInfo, CAP-ConnectToResource, CAP-PlayAnnouncement and CAP-SpecializedResourceReport. On medium-term the usage of IN-announcements in foreign PLMNs is not expected. Thus the information flow CAP-ARI is only used inside the HPLMN(a) and is not tested over network boundaries.
- CAP-Cancel is not tested because the usage of this information flow in foreign PLMNs is not expected on medium-term.
- The support of USSD communication between MS and gsmSCF is not tested because the transmission of the USSD from the HLR to the gsmSCF is inside PLMN(a) and thus no IR topic. It is recommended to run this test during HPLMN internal tests.
- Testing of the support of alerting categories downloaded from SCF is not considered as important.

- Testing of the support of CellID in geographical data to give the VLR the option to return a stored CellID in response to a request for location information is not considered as important.
- The support of forwarded-to-numbers in SPNP or other short number format by CAMEL supporting VLRs is a pure HLR functionality and thus not part of IREG testing. It is recommended to run this test during HPLMN internal tests.
- Reporting of abandon events is not tested, because it is not possible to make this event visible to the tester without using a protocol analyser.

#### Topics related to CAMEL Phase 3: Circuit Switched Call Control

- Features already available in CAMEL Phase 2 are not tested for CAMEL Phase 3 because it is assumed, that HPLMN(a) will choose CAMEL Ph2 O-CSI for this purpose.
- The information flow CAP-ContinueWithArgument is not considered as important, because also CAP-CON may be used by services for the same purpose. Thus CAP-ContinueWithArgument is not tested here.

#### Topics related to CAMEL Phase 3: MO SMS control

- The information flow CAP-FurnishChargingInformationSMS is not considered as important and thus not tested here.
- The information flow CAP-ResetTimerSMS is not considered as important and thus not tested here.

#### Topics related to CAMEL Phase 3: GPRS control

- Because of the high expenditure to be spent in VPLMN(b) ChangeOfPosition is not tested.
- The information flow CAP-SendChargingInformationGPRS - used for AoC - is not considered as important and thus not tested here.
- The information flow CAP-CancelGPRS is not tested because the usage of this information flow in foreign PLMNs is not expected on medium-term.
- The information flow CAP-ResetTimerGPRS is not considered as important and thus not tested here.
- The information flow CAP-ActivityTestGPRS is not tested, because the initiation timers are SCP dependent.

#### Topics related to CAMEL Phase 3: general

- The features within "Control and interrogation of subscription data" are only used inside the HPLMN(a) and thus they are not tested over network boundaries.
- The feature AoC within CAMEL Phase 3 is not considered as important and thus not tested here.
- It is not expected on medium-term that operators will use the feature "Terminating CAMEL Subscription Information for the VMSC (VT-CSI)", thus no tests are included.
- There are no tests included for Trigger Detection Points "DP Analysed\_Information" and "DP Route\_Select\_Failure" because they are not considered as important.

- “Network Service CAMEL Subscription Information (N CSI)” identifies services offered on a per-network basis by the VPLMN operator, and so it is out of scope for international roaming tests.
- “Dialled Service CAMEL Subscription Information (D CSI)” is not tested, because it is not expected that operators will use this feature on medium-term.
- The information flow CAP-CallGap is not tested because it is unlikely that overload will origin from a VMSC and the feature is very hard to test in an international roaming environment.
- Parts within CAMEL Phase3 regarding Support of Optimal Routing are not tested because no operator has yet announced to use SOR.

### 1.3 Strategy for Testing

To execute the described test cases a CAMEL test service is required. In order to maximise the efficiency of testing, the test cases have been drawn up so as to minimise the requirement for simultaneous joint activity by both PLMN(a) and PLMN(b). This concerns on the one hand the administration of mobile subscriber data in the HLR and on the other hand the administration of data for the CAMEL test service. To achieve this, the required reaction of the SCF follows from the dialled digits (Figure 1).

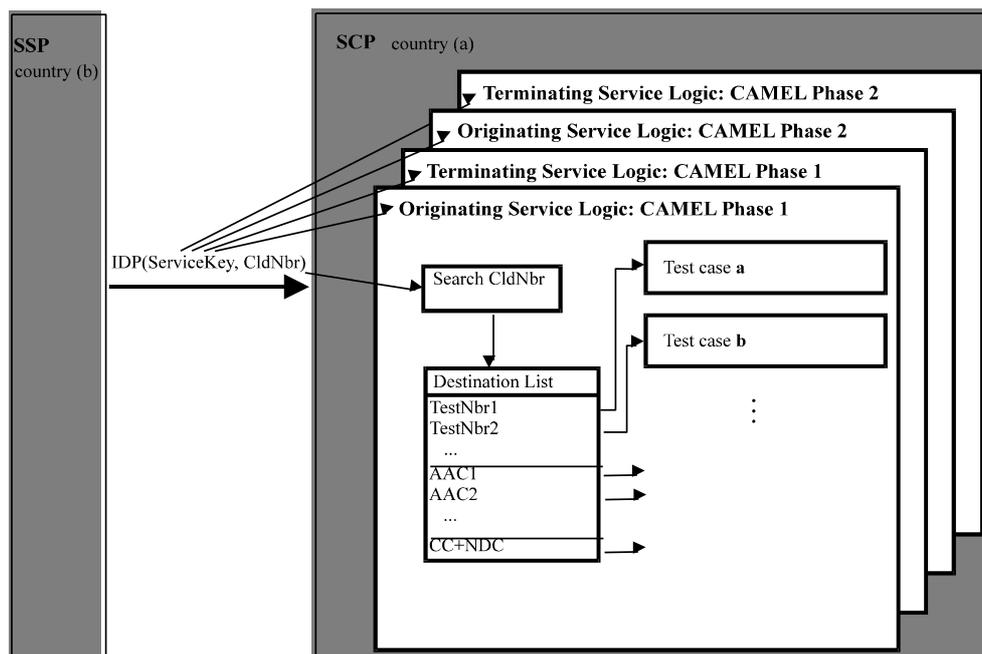
In the test service for CAMEL Phase1 and Phase2 a list of dialled numbers, called destination list, is included. The numbers listed here are linked to a corresponding action, which is required for the specific test case.

Within CAMEL Ph3 SMS Control the combination of SMSC address, DestinationSubscriberNumber and CallingPartyNumber is used in the test service to determine the appropriate action. For GPRS Control the gprsEventType and the APN and for Mobility Management the parameter eventMet within the information flow NoteMMEEvent is used for this purpose.

Additionally the test cases have been drawn up so that it is possible to execute them automatically.

The test programme consists of three distinct components:

1. HPLMN(a) issues pre-programmed SIM cards and programmes HLR and the Service Logic
2. PLMN(b) performs tests
3. PLMN(b) and HPLMN(a) discuss results.



**Figure 1 Schematic representation of the test service for CAMEL Ph1 and Ph2.**

### 1.4 Service Logic

A description for the implementation of the originating and the terminating service logic entry processes is shown in chapter 2.1 for CAMEL Phase 1 and chapter 2.2 for CAMEL Phase 2 by means of a SDL diagram. The actions referred to in these diagrams are described at the end of the single test cases.

General requirements for the implementation of the service logic are detailed below:

- Four different service keys are used for originating and terminating triggered services in CAMEL Phase 1 and Phase 2. The ability to administrate these service keys has to be given.
- Only the parameters included in the SDL diagrams for received messages have to be checked from the service logic. If no value is given here, only the existence has to be checked. There may be additional parameters included; these should not influence the service behaviour.
- Only the parameters shown in the SDL diagrams have to be included in the outgoing messages.
- The service logic shall only follow the explicitly shown behaviour, otherwise go into the idle state and not continue the call handling. This is necessary to avoid success test cases after error conditions.
- The ability to administrate the numbers in the destination list has to be given. This applies to:
  4. Test Numbers: TestNbr1, ...
  5. Destination numbers of announcements: AAC1, ...
  6. Country code (CC) and network destination code (NDC) of country(a)

- The ability to configure several different network destination codes of country(a) has to be given. In case a number has to be compared to CC+NDC of country(a), this has to be done for each NDC configured (see test case 2.1.3). HPLMN(a) has to take care, that all the NDCs of the SIM cards used for IREG CAMEL tests (MSx(a)) are listed in the destination list.
- The ability to administrate the destination number located in country(c), DN(c), has to be given.
- The service logic shall be designed in a way that SCCP-XUDT messages as a result of multiple operations in one TCAP message are not used. XUDT messages will not be supported throughout all networks.

The following shows the entries in the destination list:

Originating Service Logic: CAMEL Phase 1	Terminating Service Logic: CAMEL Phase 1	Originating Service Logic: CAMEL Phase 2	Terminating Service Logic: CAMEL Phase 2
TestNbr1 TestNbr2 TestNbr3 AAC1 AAC2 AAC3 CC+NDC1 CC+NDC2 ... (Support of several different NDCs)	CC+NDC	TestNbr4 TestNbr5 TestNbr6 TestNbr7 TestNbr8 TestNbr9 TestNbr10 AAC4 AAC5 CC+NDC1 CC+NDC2 ... (Support of several different NDCs)	CC+NDC
Additionally a data field for the destination number in country(c), DN(c), has to be available.		Additionally a data field for the destination number in country(c), DN(c), has to be available.	

## 1.5 Prerequisites for testing

This section describes the pre-requisites that PLMNs are strongly recommended to have completed prior to the start of CAMEL IREG testing as specified in this PRD.

The activity of inter PLMN testing will take place more effectively and efficiently if the two PLMNs have already independently acquired practical expertise in the functions which are being tested. Accordingly it is recommended that prior to the start of inter-PLMN testing of CAMEL functionality, the two PLMNs have already achieved the following:

- Basic Roaming capability with several PLMNs, as specified in PRD IR24.
- CAMEL protocol level tests, to make sure, that CAMEL works properly in the own PLMN.
- Practical experience of using CS-1, Core-INAP or CAMEL protocols within their own PLMN. This practical experience should include the setting of MSC/SSP and/or

CAMEL server datafill, the ability to analyse the CAP/INAP protocol and familiarity with the "test" service logic to be used in the CAMEL server. It is recognised that the practical experience may need to be gained from a test laboratory or demonstration/trial network.

Additionally, it is highly recommended that the service logic be very carefully tested in the HPLMN(a) before starting International Roaming Tests. This is necessary because the IREG tester in VPLMN(b) cannot determine, that the service logic for the test case is being correctly invoked. If there are errors in the service logic, the test results will be unreliable.

HPLMNs are recommended to ensure that there is adequate control within their HLRs and network infrastructure to allow the following types of roaming to exist simultaneously either as independent or overlapping sets of VPLMNs:

- "IR24" roaming to be in operation with a VPLMN or set of VPLMNs for Test SIMs,
- "IR24" roaming to be in operation with a different set of VPLMNs for all customers,
- "CAMEL" roaming to be in operation with a further set of VPLMNs for Test SIMs,
- "CAMEL" roaming to be in operation with a fourth set of VPLMNs for all customers

**Warning:** Some implementations do not allow to provide CAMEL roaming on a per service level. This may lead to the situation, that after introduction of CAMEL roaming for test purposes, all CAMEL services of HPLMN(a) are accessible in VPLMN(b).

## 2 Test Cases

The test configuration is shown in Figure 3 below. It is anticipated that it may be necessary to monitor both signalling messages and voice calls on any of the Network Entity interfaces shown in the diagram. However this is not a firm requirement for this test specification.

With the destination numbers of announcement 1 to 3, AAC1 to AAC3, used in the service logic to select a specific SCF action the corresponding AAC is reached.

The description of the test cases are built up as detailed below:

- Title
- Short textual test overview
- Informative Message flow (The message flows are not claimed to be complete)
- Textual description of preconditions, actions, service logic, results and comments
- Description of the service logic by means of a SDL diagram

Note: In some test cases the AACs are called directly from the MS. In this case, the international format for type of number shall be used, that is, "+" shall be dialled when setting up a call.

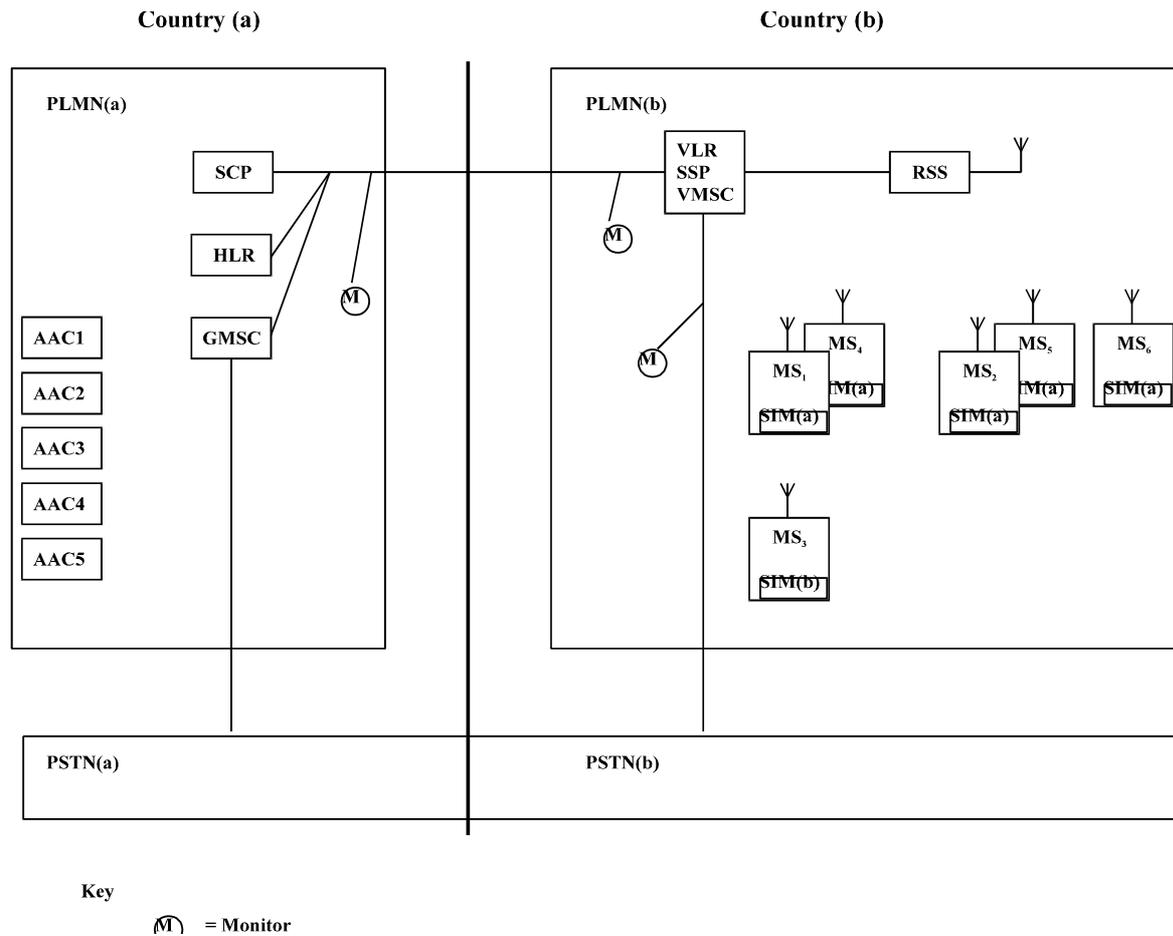
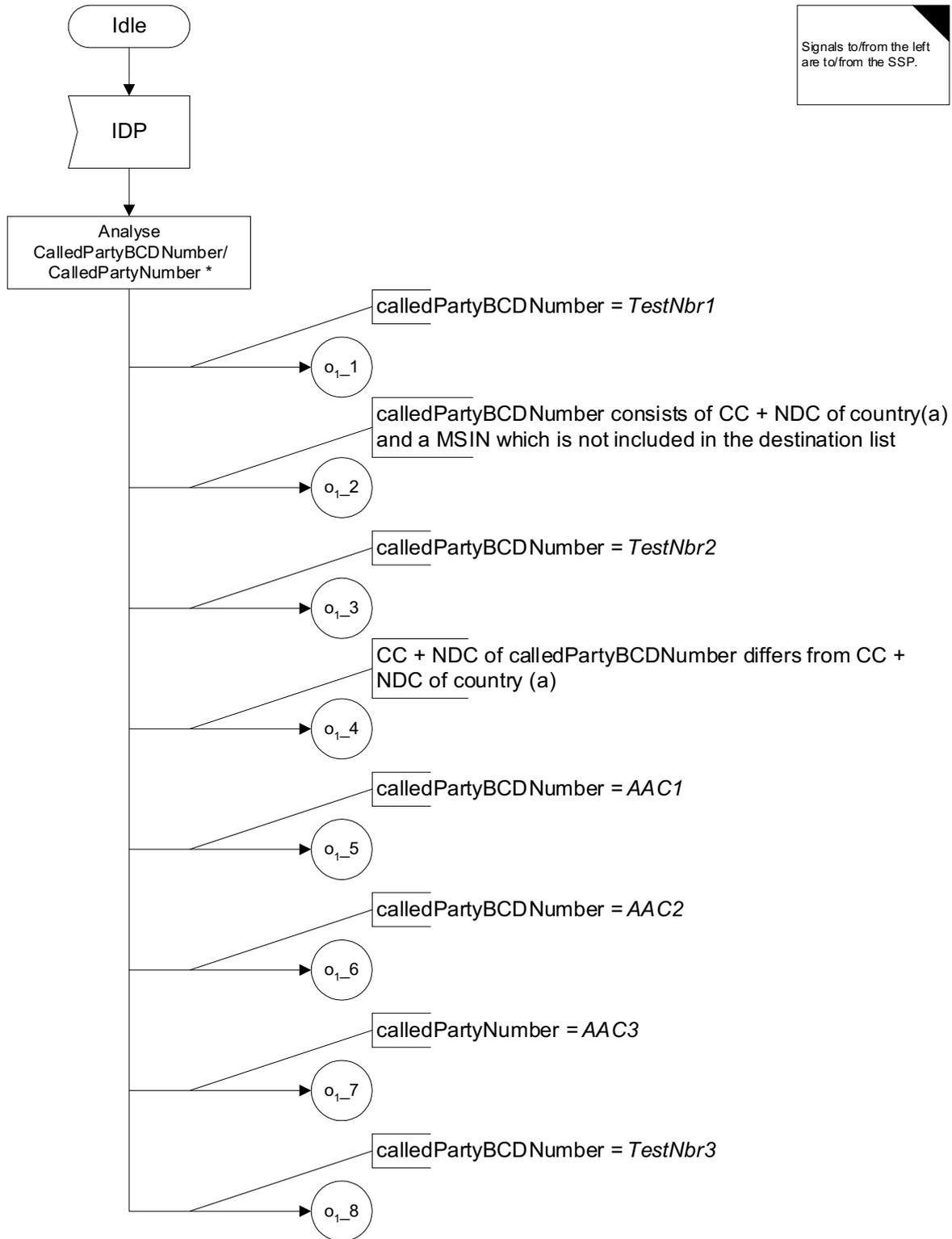


Figure 2: Test case Configuration

## 2.1 Camel Phase 1

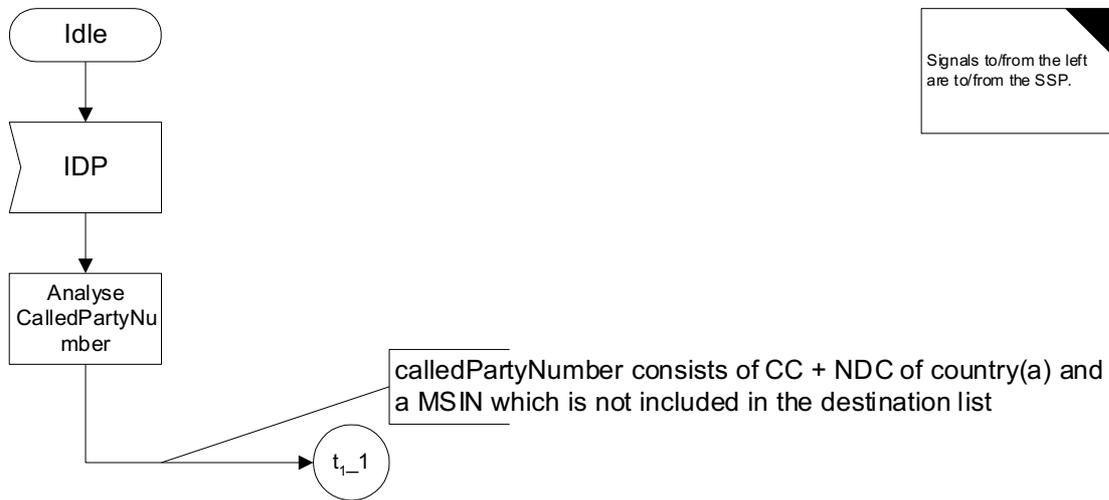
Originating Service Logic: CAMEL Phase 1



**Figure 3: Entry process for originating service logic: CAMEL Phase 1**

**Note:** Use Best Fit algorithm to branch into the proper path.

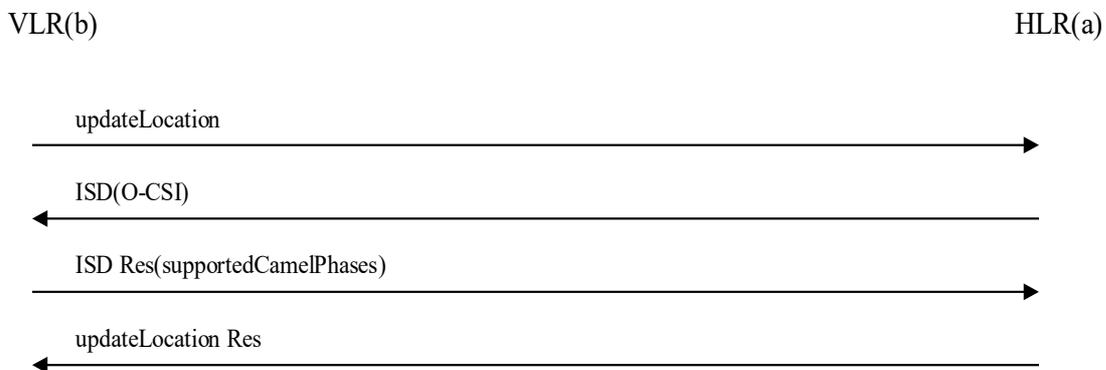
Terminating Service Logic: CAMEL Phase 1



**Figure 4: Entry process for terminating service logic: CAMEL Phase 1**

**2.1.1 Location Update**

Message-flow:



**2.1.1.1 Location Update by MS<sub>1</sub>(a) in VPLMN(b)**

Overview

MS<sub>1</sub>(a) registers in VPLMN(b). The successful insertion of subscriber data – example: O-CSI – in the VLR is verified.

- Preconditions:** MS<sub>1</sub>(a) contains SIM of HPLMN(a).  
 No VLR record exists for MS<sub>1</sub>(a).  
 HLR record contains basic and supplementary service information as well as O-CSI.
- Action:** Power-up MS<sub>1</sub>(a) and perform location registration on VPLMN(b).  
 Check VLR record for the IMSI/MSISDN of MS<sub>1</sub>(a).

Service logic: -  
 Result: Successful result if at least the following entries are included in VLR record:  
 Teleservice TS11 provisioned  
 SS: BOICexHC : Provisioned  
 SS: CFNRy : Provisioned  
 O-CSI  
 TriggerDetectionPoint: *CollectedInfo, DP2*  
 ServiceKey: equal to information provided by HPLMN(a)  
 gsmSCFAddress: equal to information provided by HPLMN(a)  
 defaultCallHandling: *continueCall*  
 Comments: This test case confirms operation of Insert Subscriber Data procedure including O-CSI and that the required subscriber profile for MS<sub>1</sub>(a) is available. If the required subscriber profile is not included in the VLR, the error has to be sorted out before continuation of tests.

#### SCP Service Logic

The service logic is not involved here.

#### 2.1.1.2 Location Update by MS<sub>2</sub>(a) in VPLMN(b)

##### Overview

MS<sub>2</sub>(a) registers in VPLMN(b). It is verified, that the required subscriber profile for MS<sub>2</sub>(a) – example: O-CSI – is available.

Preconditions: MS<sub>2</sub>(a) contains SIM of HPLMN(a).  
 No VLR record exists for MS<sub>2</sub>(a).  
 HLR record contains basic and supplementary service information as well as O-CSI.  
 Action: Power-up MS<sub>2</sub>(a) and perform location registration on VPLMN(b).  
 Check VLR record for the IMSI/MSISDN of MS<sub>2</sub>(a).  
 Service logic: -  
 Result: Successful result if the following entries are included in VLR record:  
 Teleservice TS11 provisioned  
 ODB-BOICexHC : Active  
 O-CSI  
 TriggerDetectionPoint: *CollectedInfo, DP2*  
 ServiceKey: equal to information provided by HPLMN(a)  
 gsmSCFAddress: equal to information provided by HPLMN(a)  
 defaultCallHandling: *releaseCall*  
 Comments: This test case confirms that the required subscriber profile for MS<sub>2</sub>(a) is available. If the required subscriber profile is not included in the VLR, the error has to be sorted out before continuation of tests.

SCP Service Logic

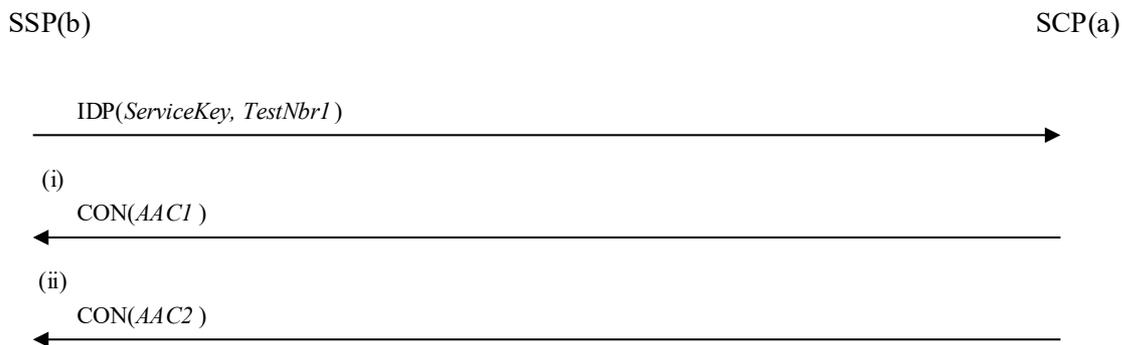
The service logic is not involved here.

**2.1.2 Check operation of IDP and CON**

Overview:

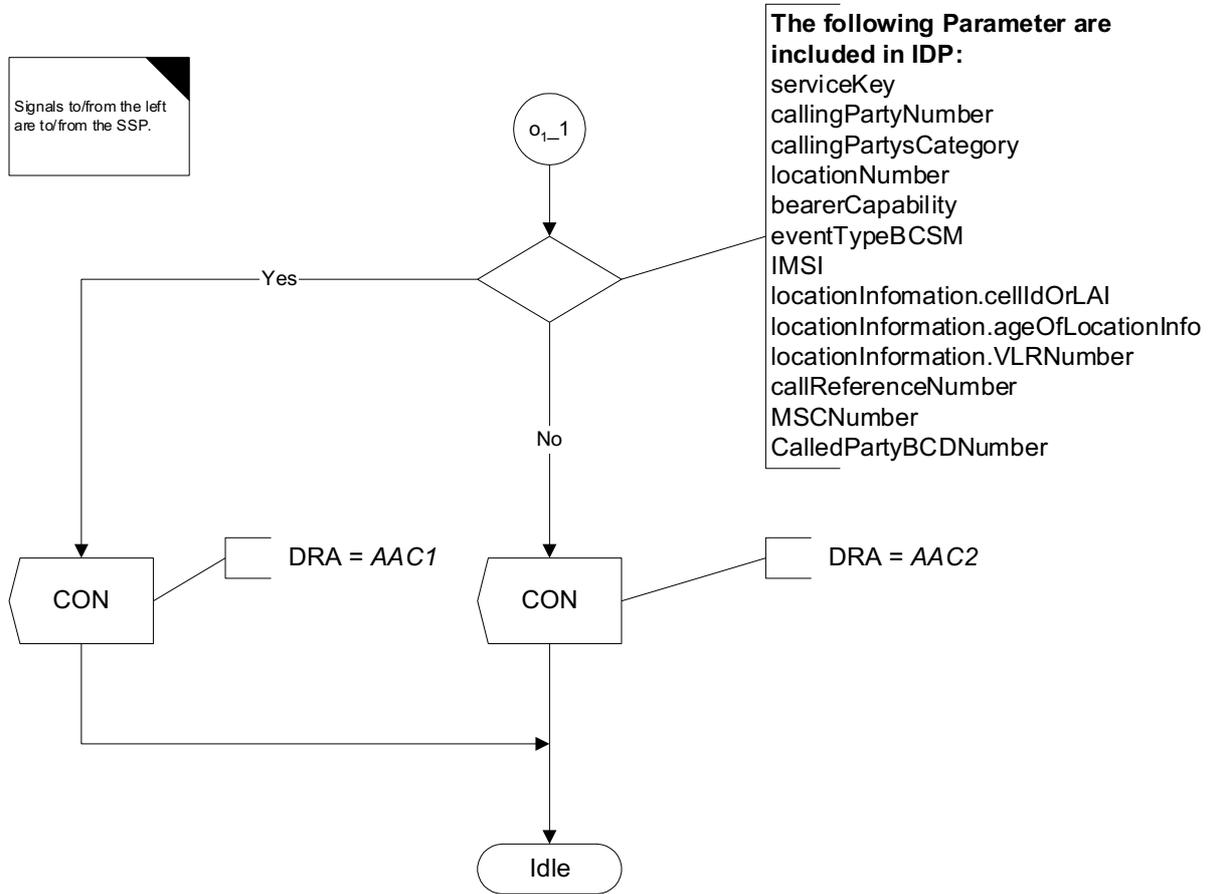
MS<sub>1</sub>(a), registered in VPLMN(b), makes a call to *TestNbr1*. Depending on InitialIDP contents, either Test Announcement 1 (AAC1) or Test Announcement 2 (AAC2) is played. The contents of InitialIDP are checked and the operation of CAP-Connect is verified.

Message-flow:



- Preconditions:** MS<sub>1</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>1</sub>(a) contains "O-CSI". [Set by HLR Admin]
- Action:** MS<sub>1</sub>(a) attempts a call to *TestNbr1*.
- Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr1*:
- (i) If SCF has received all required parameters within the IDP, the SCF alters the destination address to be that of Test Announcement 1.  
SCF sends Connect.
  - (ii) If SCF does not receive all parameters within the IDP, the SCF alters the destination address to be that of Test Announcement 2.  
SCF sends Connect.
- Result:**
- (i) Successful result if Test Announcement 1 is played to calling party.
  - (ii) If Test Announcement 2 is played to calling party, at least one parameter of the IDP is missing and the test has failed.
- Comments:** This test case confirms operation of IDP and Connect and ensures that all parameters are present in the IDP. If no announcement is played, a fundamental error has occurred and it has to be sorted out before continuation of tests.

SCP Service Logic



**Figure 5: Check operation of IDP and CON**

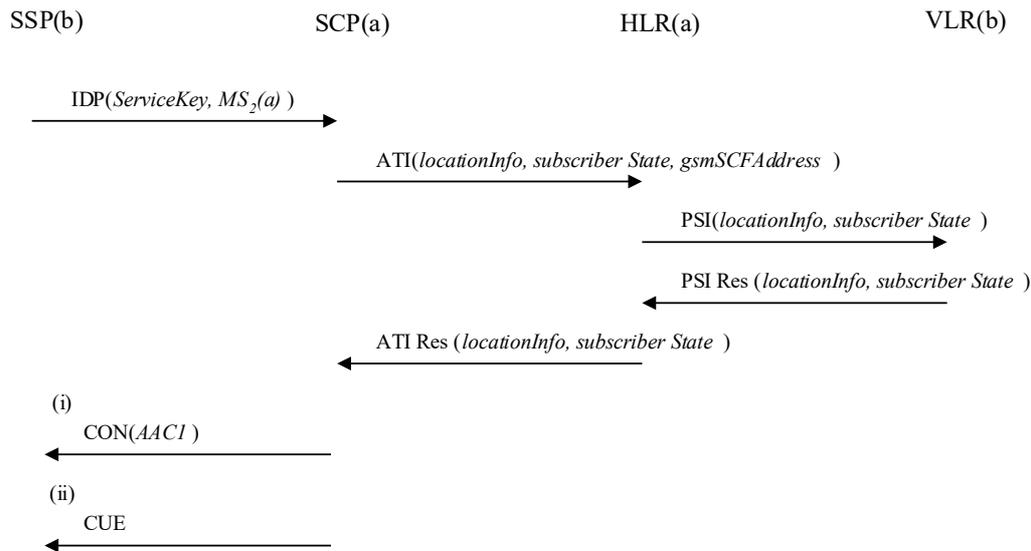
**Note:** Additional parameter may be included in IDP. This still leads to CON(DRA=AAC1).

### 2.1.3 Check operation of PSI

Overview:

MS<sub>1</sub>(a) makes a call to MS<sub>2</sub>(a), both registered in VPLMN(b). Depending on the subscriber state retrieved, either Test Announcement 1 (AAC1) is played or the call is connected. The operation of ProvideSubscriberInfo and the correct reporting of the subscriber state is verified.

Message-flow:



**Preconditions:** MS<sub>1</sub>(a) and MS<sub>2</sub>(a) have location updated successfully in VPLMN(b). HLR entry for MS<sub>1</sub>(a) contains "O-CSI". [Set by HLR Admin]  
 MS<sub>2</sub>(a) is busy.

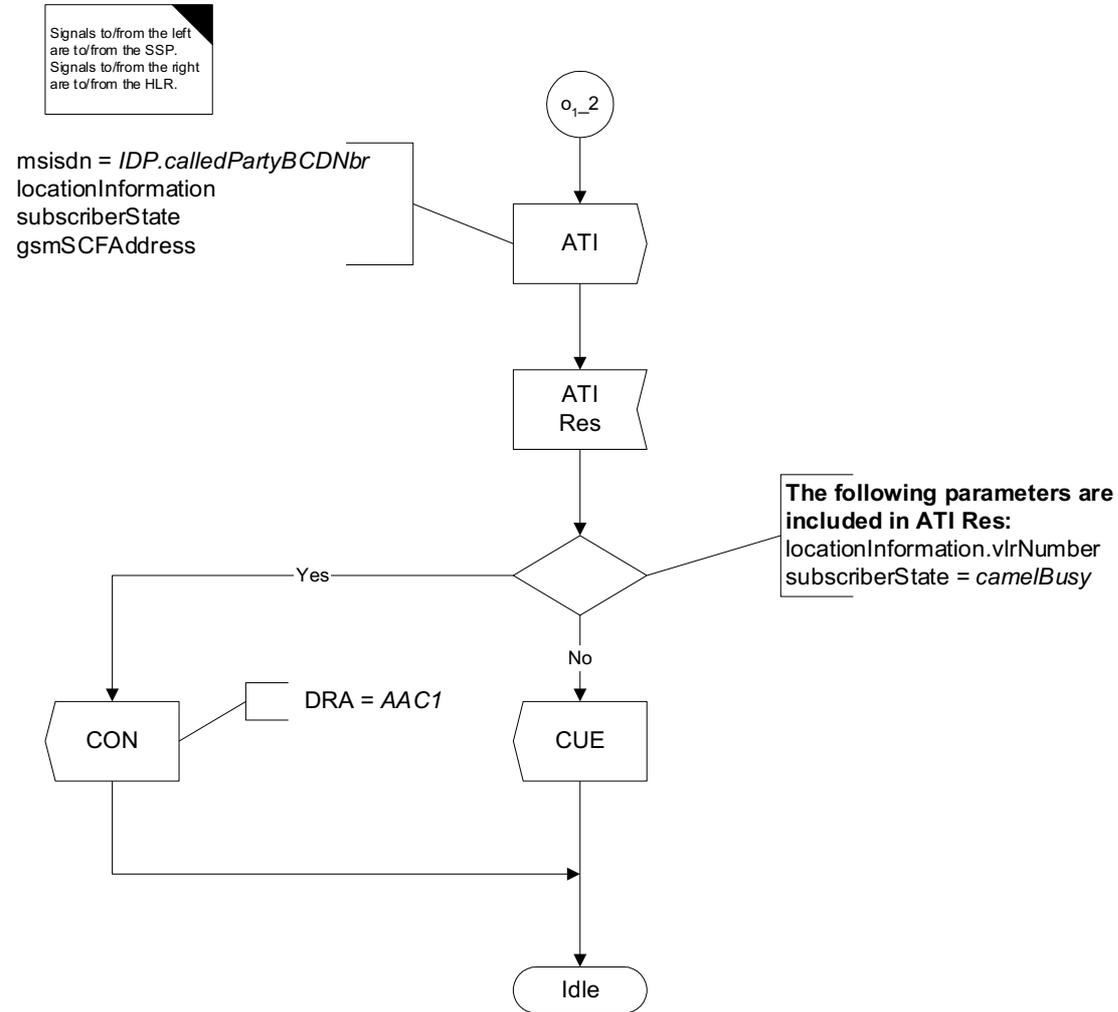
**Action:** MS<sub>1</sub>(a) attempts a call to MS<sub>2</sub>(a).

**Service logic:** IDP.calledPartyBCDNumber consists of CC+NDC of country (a) and a MSIN which is not included in the destination list:  
 SCF starts Any Time Interrogation and requests Location Information and Subscriber State of MS<sub>2</sub>(a).  
 (i) If subscriber state in Any Time Interrogation Result equals camelBusy, SCF alters destination address to that of Test Announcement 1 and sends CON.  
 (ii) If subscriber state is any other, SCF sends CUE.

**Result:** Successful result if Test Announcement 1 is played to calling party.  
 If the busy tone is played to calling party, the subscriber state was incorrect.

**Comments:** This test case confirms operation of Provide Subscriber Information to retrieve a correct subscriber state.

SCP Service Logic



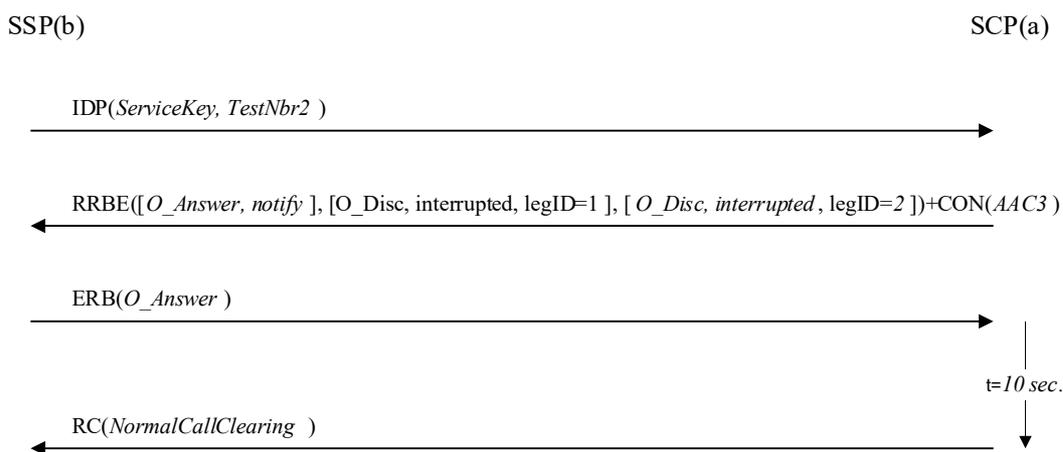
**Figure 6: Check operation of PSI**

### 2.1.4 Check reporting of EDP O\_Answer and operation of RC

Overview:

MS<sub>1</sub>(a), registered in VPLMN(b), makes a call to TestNbr2. 10 seconds after Test Announcement 3 is connected to calling party, the call is released from SCP. The operation of RequestReportBCSMEven, EventReportBCSM and ReleaseCall is checked.

Message-flow:



**Preconditions:** MS<sub>1</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>1</sub>(a) contains "O-CSI". [Set by HLR Admin]

**Action:** MS<sub>1</sub>(a) attempts a call to *TestNbr2* and waits until the call is disconnected.

**Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr2*:  
 The SCF alters the destination address to be that of Test Announcement 3.  
 SCF sends RRBE([*O\_Answer, notify*], [*O\_Disc, interrupted, legID=1*], [*O\_Disc, interrupted, legID=2*])+CON. After reception of ERB(*O\_Answer*) SCF starts a timer of length 10 seconds. SCF sends RC after expiration of this timer.

**Result:** Successful result if Test Announcement 3 is played to calling party and the call is released after 10 ±1 seconds from SCP.

If the connection to Test Announcement 3 is not disconnected after 10 (±1) seconds, the test has failed.

**Comments:** This test case checks correctly reporting of EDP-N7, O\_Answer, and the ability to arm EDP-N9, O\_Disconnect. Additionally the operation of RC is checked.

SCP Service Logic

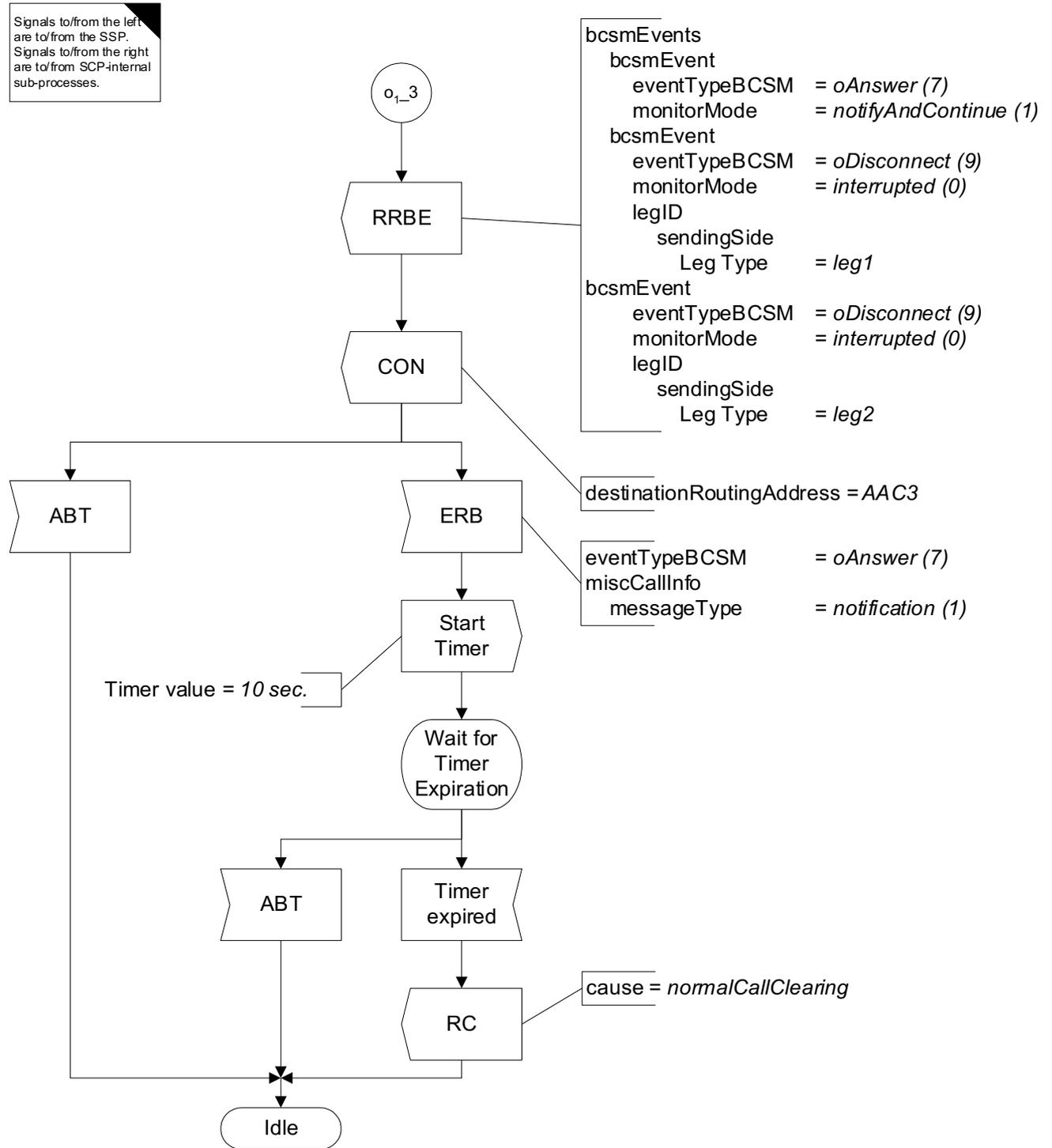


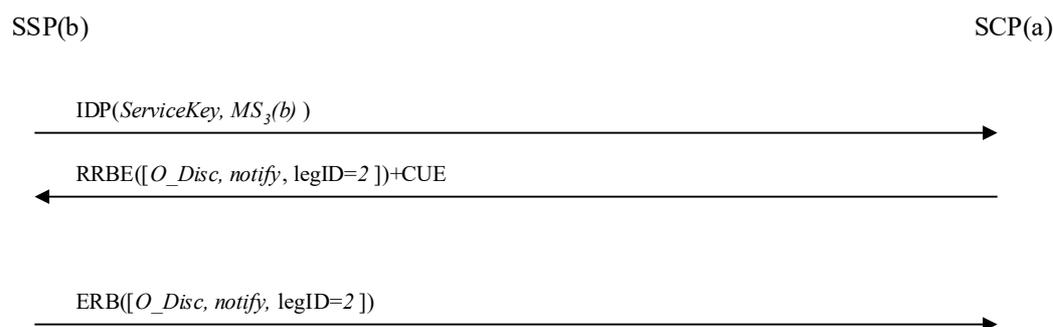
Figure 7: Check reporting of EDP O\_Answer and operation of RC

### 2.1.5 Check operation of CUE

Overview:

MS<sub>1</sub>(a) makes a call to MS<sub>3</sub>(b), both registered in VPLMN(b). The operation of CAP-Continue is checked. EDP-N9 is armed

Message-flow:



**Preconditions:** MS<sub>1</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). HLR entry for MS<sub>1</sub>(a) contains "O-CSI". [Set by HLR Admin]

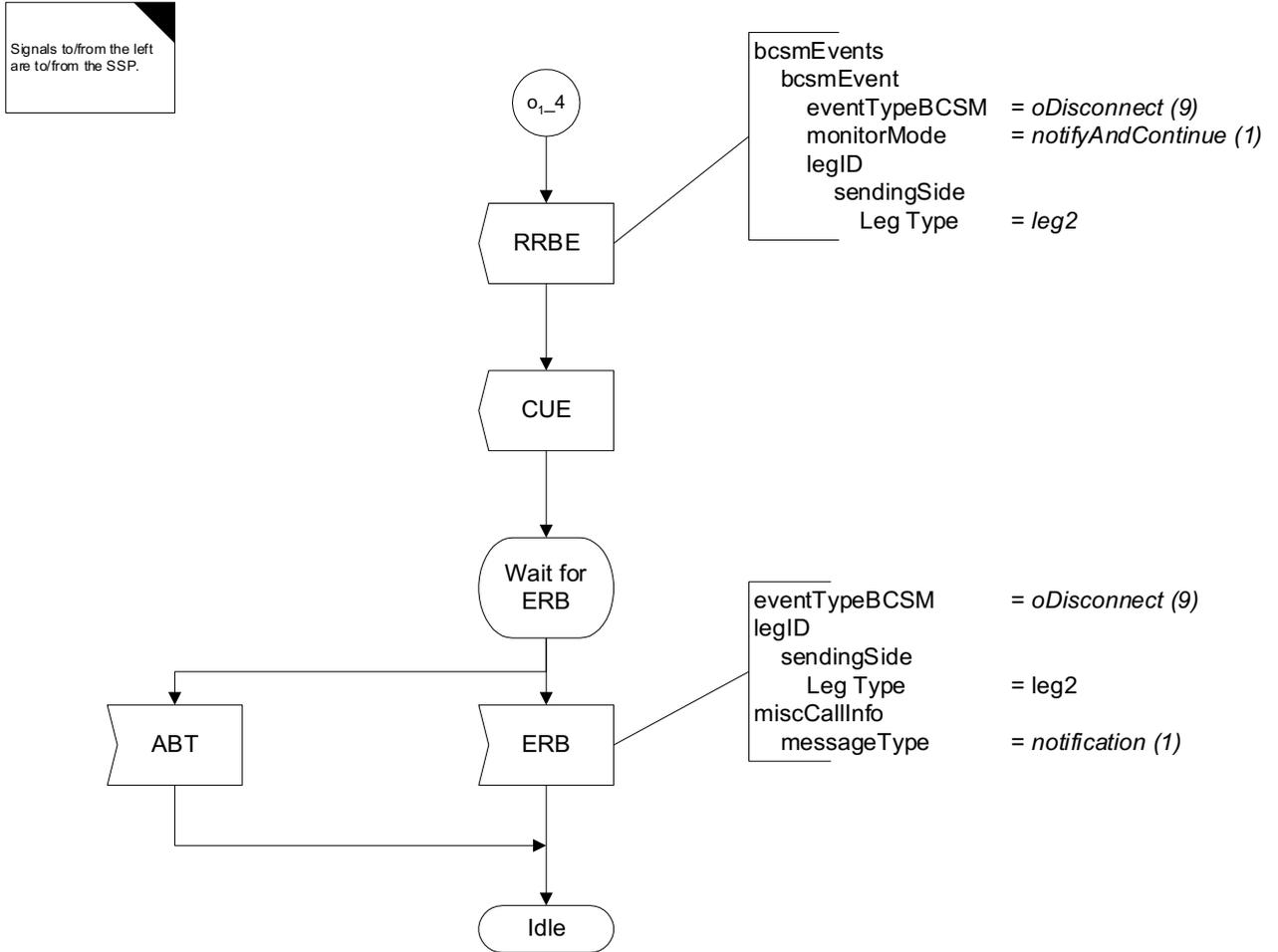
**Action:** MS<sub>1</sub>(a) attempts a call to MS<sub>3</sub>(b). MS<sub>3</sub>(b) accepts the call and the call is established. Later MS<sub>3</sub>(b) disconnects the call.

**Service logic:** CC + NDC of IDP.calledPartyBCDNumber differs from CC + NDC of country (a): SCF sends RRBE([O\_Disc, notify, legID=2])+CUE.

**Result:** Successful result if call is established to MS<sub>3</sub>(b).

**Comments:** This test case checks operation of CUE. It is also possible for the tester to check whether EDP-N9 has been properly reported to the SCP by checking the ERB message after MS<sub>3</sub>(b) has disconnected the call. For this it is necessary to use a Protocol Analyser. This part of the test case is optional.

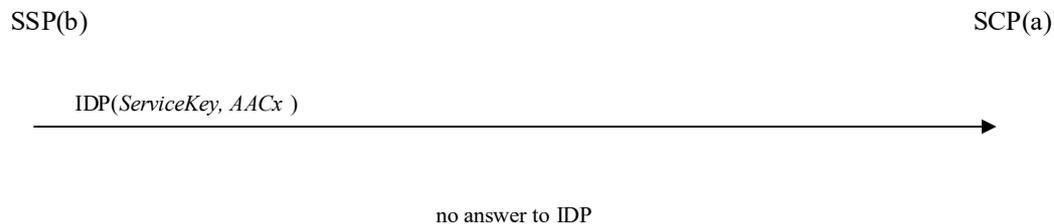
SCP Service Logic



**Figure 8: Check operation of CUE**

## 2.1.6 Check Default Call Handling

Message-flow:



### 2.1.6.1 defaultCallHandling set to continueCall

Overview:

MS<sub>1</sub>(a), roaming in VPLMN(b), makes a call to Test Announcement 1. SCP does not answer to InitialIDP. The Default Call Handling of MS<sub>1</sub>(a) equals *continueCall*. The call is connected to Test Announcement 1. The correct utilisation of the Default Call Handling is verified.

Preconditions:	MS <sub>1</sub> (a) has location updated successfully in VPLMN(b). HLR record of MS <sub>1</sub> (a) contains O-CSI with parameter defaultCallHandling set to <i>continueCall</i> . [Set by HLR Admin]
Action:	MS <sub>1</sub> (a) attempts a call to AAC1.
Service logic:	IDP.calledPartyBCDNumber equals AAC1: SCF does not answer to IDP. Alternatively SCF may send an Abort message.
Result:	Successful result if Test Announcement 1 is played to calling party.
Comments:	This testcase checks the correct utilisation of the O-CSI parameter defaultCallHandling= <i>continueCall</i> . Some SCF implementations do not allow to send no answer to IDP. In this case SCP should send an Abort message, which triggers the default call handling in the SSF.

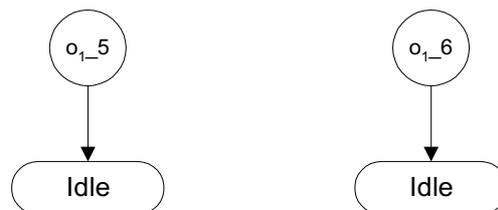
### 2.1.6.2 defaultCallHandling set to releaseCall

Overview:

MS<sub>2</sub>(a), roaming in VPLMN(b), makes a call to Test Announcement 2. SCP does not answer to InitialIDP. The Default Call Handling of MS<sub>2</sub>(a) equals *releaseCall*. The call is released. The correct utilisation of the Default Call Handling is verified.

- Preconditions:** MS<sub>2</sub>(a) has location updated successfully in VPLMN(b).  
 HLR record of MS<sub>2</sub>(a) contains O-CSI with parameter defaultCallHandling set to *releaseCall*. [Set by HLR Admin]
- Action:** MS<sub>2</sub>(a) attempts a call to AAC2.
- Service logic:** IDP.calledPartyBCDNumber equals AAC2:  
 SCF does not answer to IDP. Alternatively SCF may send an Abort message.
- Result:** Successful result if call is **NOT** established and Test Announcement 2 is **NOT** played to calling party.
- Comments:** This test case checks the correct utilisation of the O-CSI parameter defaultCallHandling=*releaseCall*.  
 Some SCF implementations do not allow to send no answer to IDP. In this case SCP should send an Abort message, which triggers the default call handling in the SSF.

SCP Service Logic



**Figure 10: defaultCallHandling set to releaseCall**

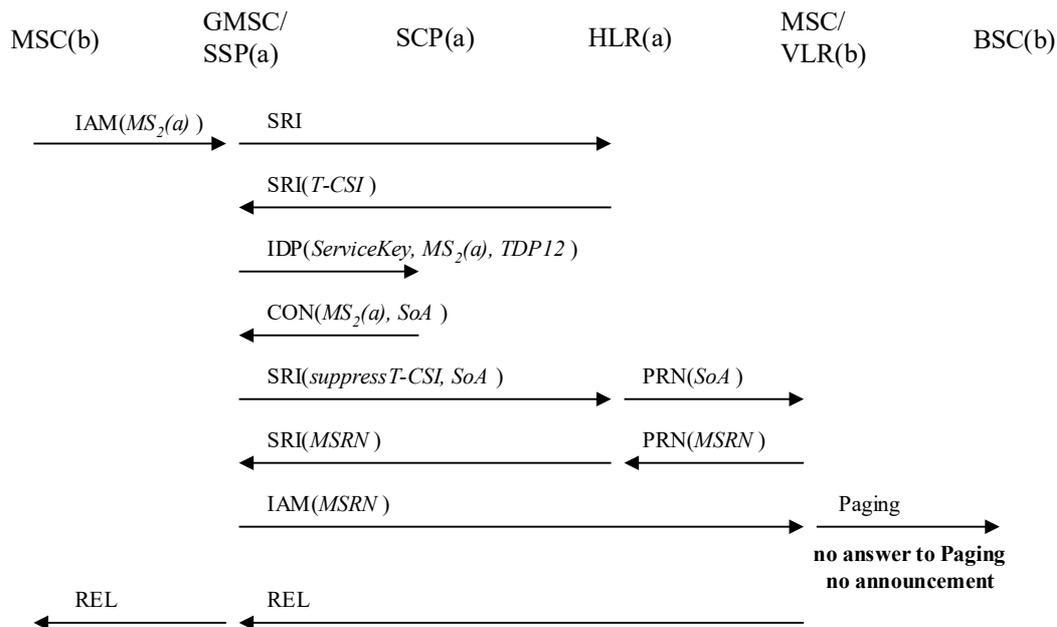
**Note:** In case SCP implementation does not allow to send no answer to IDP an Abort message should be sent.

### 2.1.7 Check Suppression Of Announcement

Overview:

MS<sub>3</sub>(b) makes a call to MS<sub>2</sub>(a), both registered in PLMN(b). SCP instructs VPLMN(b) to suppress announcements. The correct utilisation of the parameter SuppressionOfAnnouncement is verified.

Message-flow:



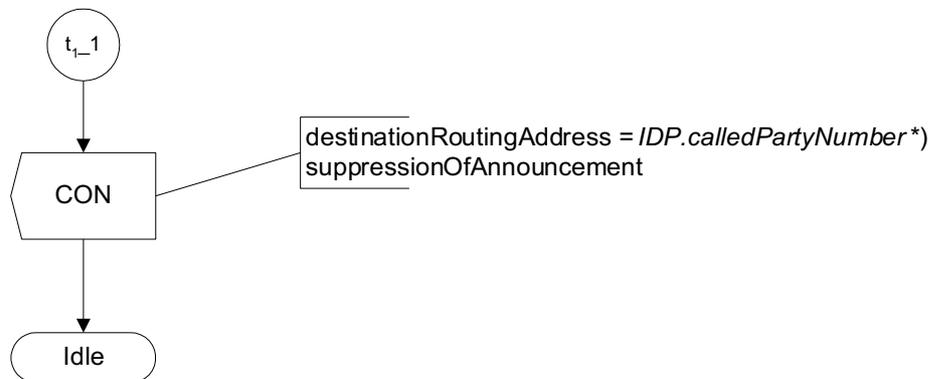
- Preconditions:** MS<sub>2</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). HLR entry for MS<sub>2</sub>(a) contains "T-CSI". [Set by HLR Admin]  
 No GSM Call Forwarding is active for MS<sub>2</sub>(a).
- Action:** MS<sub>2</sub>(a) takes battery off in order to provoke unsuccessful call establishment detected in VMSC.  
 MS<sub>3</sub>(b) attempts a call to MS<sub>2</sub>(a).
- Service logic:** IDP.calledPartyNumber consists of CC+NDC of country(a) and a MSIN which is not included in the destination list.  
 SCF sends CON with all parameters unchanged, including SoA Information Element.
- Result:** Successful result if no announcement or the announcement of HPLMN is played to calling party.  
 Unsuccessful result if an announcement of VPLMN(b) is played to calling party.
- Comments:** This test case confirms operation of the suppression of announcement in case of unsuccessful call establishment detected at the VMSC.

Note 1: In some PLMNs the connection is released because of a timeout on the ISUP interface. This event is not visible to the tester and the test case seems to be passed. The result of this test case is only reliable, if test case 2.1.8.1 or the test case "Call Forwarding on Not Reachable before IMSI detached", specified in IREG PRD IR24, is successful.

Note 2: The outcome of the test case is only reliable in case PLMN(b) plays an announcement on no paging response while SoA is not invoked.

SCP Service Logic

Signals to/from the left are to/from the SSP.



**Figure 11: Check Suppression Of Announcement**

**Note:** The number format (natureOfAddressIndicator, ...) of the destinationRoutingAddress has to be the same as the number format of IDP.calledPartyNumber. In case the number format is changed, the GMSC/SSP(a) may decide that the destination has changed and that a HLR interrogation for the new destination (SRI without the parameter suppress T-CSI) is started. This may lead into a loop.

### 2.1.8 Interaction with GSM Supplementary Services and ODB

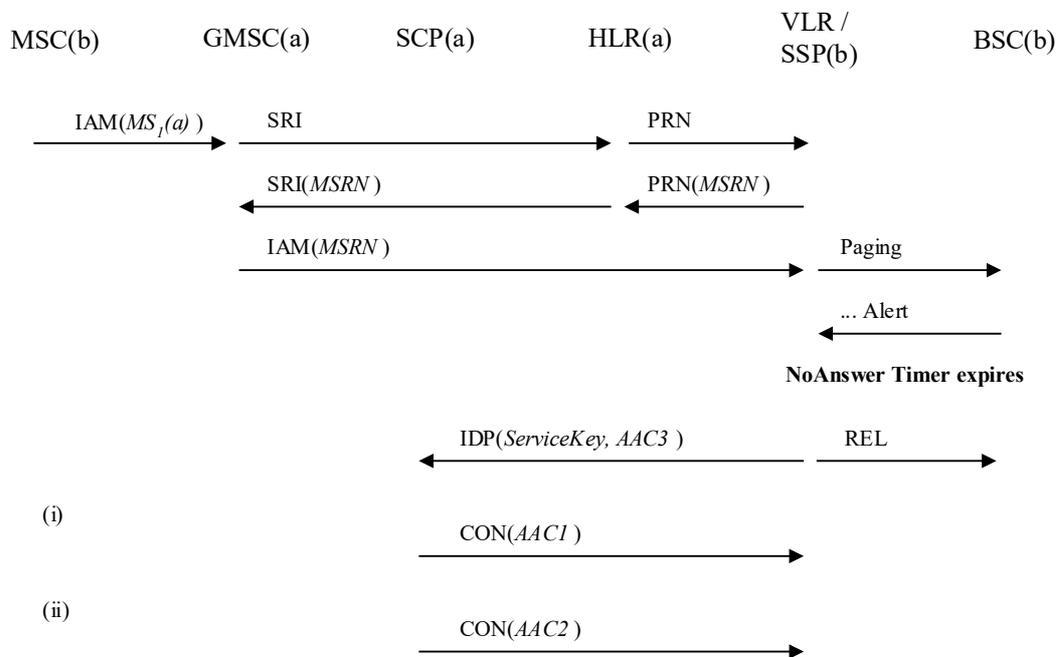
To keep the expenditure low, interaction with the GSM supplementary services Call Forwarding, Call Barring and Operator Determined Barring is tested exemplary.

#### 2.1.8.1 Call Forwarding on no reply (CFNRy)

Overview:

MS<sub>3</sub>(b) attempts a call to MS<sub>1</sub>(a). MS<sub>1</sub>(a) has activated Call Forwarding on No Reply to Test Announcement 3. MS<sub>1</sub>(a) does not answer the call. GSM call forwarding takes place and because of that the originating camel service is triggered. The triggering of originating camel services in case of late call forwarding is verified. Additionally the contents of InitialDP are checked in the mobile forwarded case.

Message-flow:



**Preconditions:** MS<sub>1</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). HLR entry for MS<sub>1</sub>(a) contains "O-CSI". [Set by HLR Admin] MS<sub>1</sub>(a) has activated CFNRy to destination number of Test Announcement 3.

**Action:** MS<sub>3</sub>(b) attempts a call to MS<sub>1</sub>(a). MS<sub>1</sub>(a) does **NOT** answer the call and MS<sub>3</sub>(b) waits until NoAnswer timer expires.

**Service logic:** IDP.calledPartyNumber equals AAC3:  
 (i) If SCF has received all required parameter within the IDP, the SCF alters destination address to that of Test Announcement 1. SCF sends CON.  
 (ii) If SCF has not received all required parameter within the IDP, the SCF alters destination address to that of Test Announcement 2. SCF sends CON.

**Result:** (i) Successful result if Test Announcement 1 is played to calling party.

(ii) If Test Announcement 2 is played to calling party, at least one parameter of the IDP is missing and the test is failed.

**Comments:** This test case confirms that in case of CFNRy an originating CAMEL service is invoked for a subscriber with O-CSI subscription and all required parameters are included in IDP.

**Note:** In some PLMNs the connection is released because of a timeout on the ISUP interface. In this case none of the Test Announcements is played to the calling subscriber and the test is failed.

SCP Service Logic

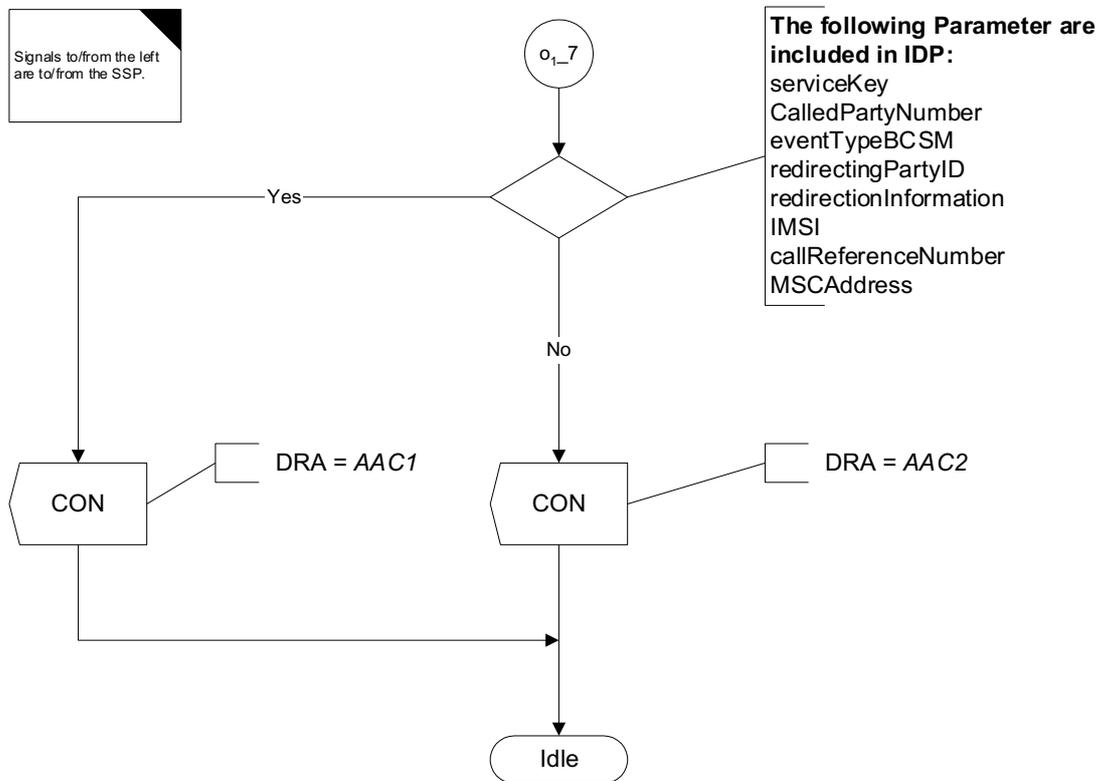


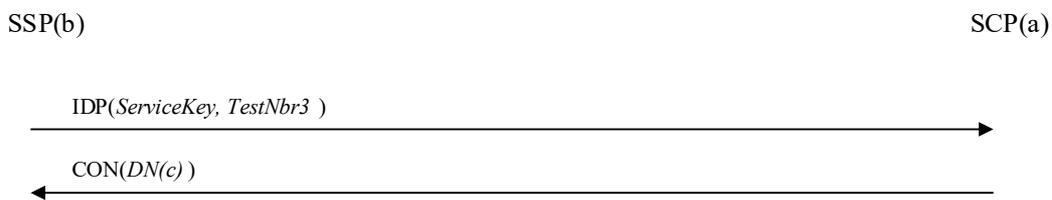
Figure 12: Call Forwarding on no reply (CFNRy)

### 2.1.8.2 Barring of outgoing international calls except to HPLMN country (BOICexHC)

Overview:

MS<sub>1</sub>(a) attempts a call to *TestNbr3*. MS<sub>1</sub>(a) has activated Barring of outgoing international calls except those directed to the HPLMN country. SCF alters the destination address to a number located in country(c). It is checked that BOICexHC is executed correctly after mobile originated CAMEL service invocation.

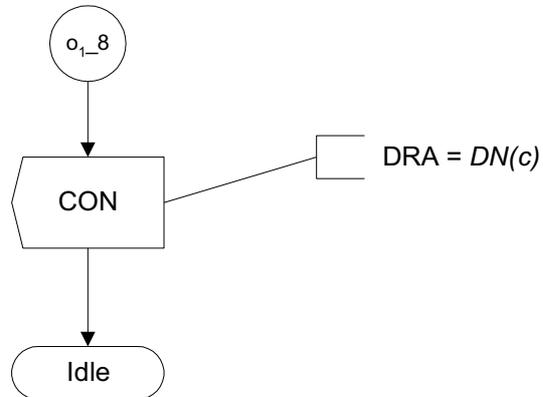
Message-flow:



- Preconditions:** MS<sub>1</sub>(a) has location updated successfully in VPLMN(b).  
 HLR entry for MS<sub>1</sub>(a) contains "O-CSI". [Set by HLR Admin]  
 "SS : BOICexHC : Active". [Set by MS]
- Action:** MS<sub>1</sub>(a) attempts a call to *TestNbr3*.
- Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr3*:  
 The SCF alters the destination address to be that of destination number located in country(c).  
 SCF sends CON.
- Result:** Successful result if call attempt fails and no announcement or a VPLMN(b) barring announcement is connected to calling party.
- Comments:** Unsuccessful result if a call attempt to DN(c) occurs.  
 This test case confirms that any originating CAMEL based service does not violate the invocation of BOICexHC supplementary service in case of mobile originated calls.
- Note:** For the destination number located in country(c) HPLMN(a) may use an Automatic Answering Circuit or a Test SIM number of a country where actually no CAMEL roaming tests are executed. It is in the responsibility of HPLMN(a) to choose a proper number. A call attempt to DN(c) occurs only if test case fails.

## SCP Service Logic

Signals to/from the left  
are to/from the SSP.



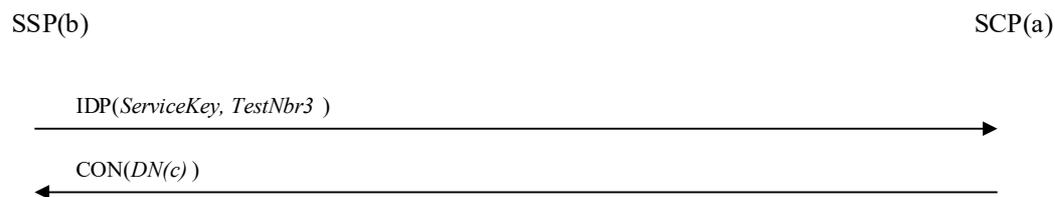
**Figure 13: Barring of outgoing international calls except to HPLMN country (BOICexHC)**

### 2.1.8.3 ODB: Barring of outgoing international calls except to HPLMN country (ODB-BOICexHC)

#### Overview:

MS<sub>2</sub>(a) attempts a call to *TestNbr3*. Operator Determined Barring - Barring of outgoing international calls except those directed to the HPLMN country applies to MS<sub>2</sub>(a). SCF alters the destination address to a number located in country(c). It is checked that ODB-BOICexHC is executed correctly after mobile originated CAMEL service invocation.

#### Message-flow:



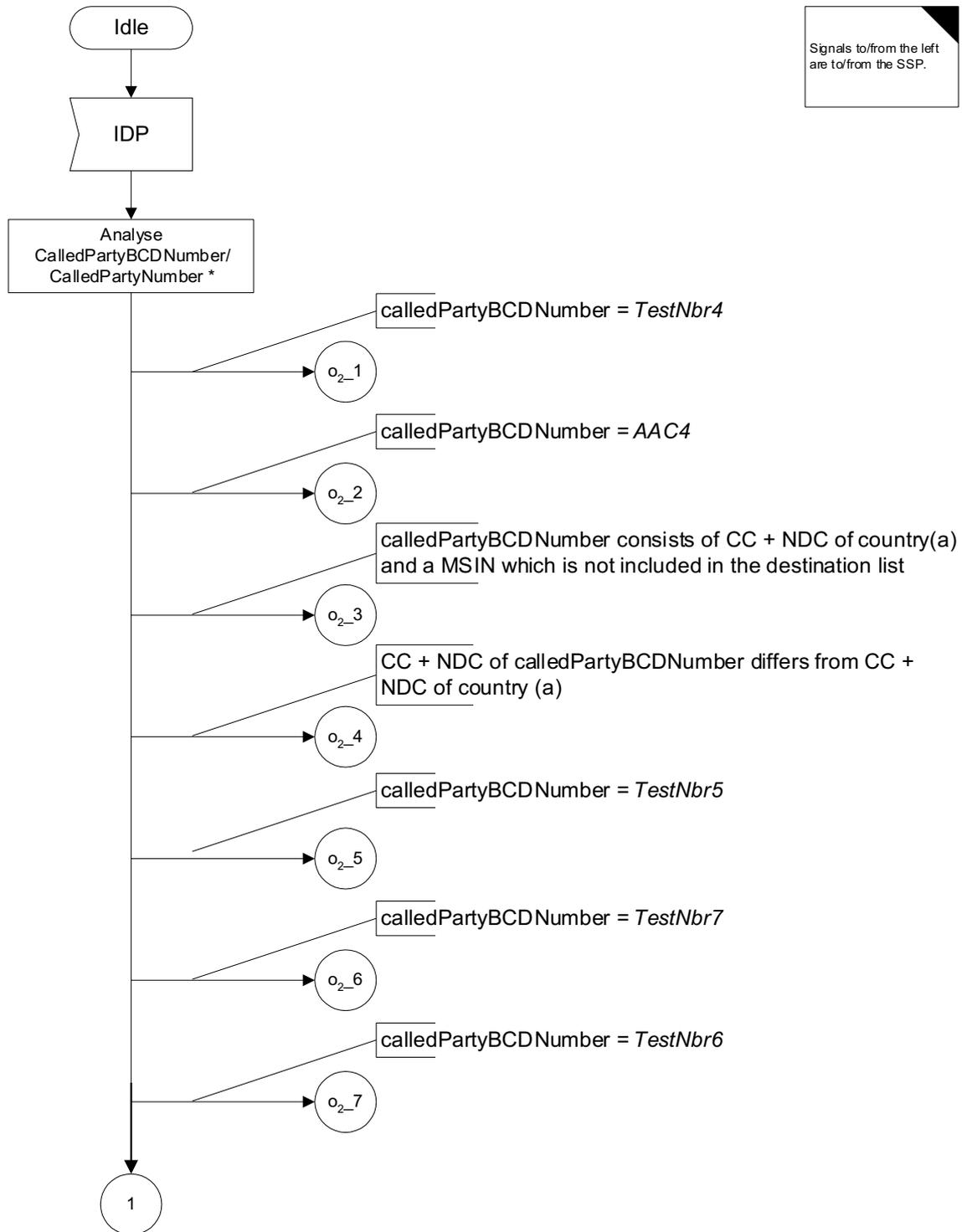
Preconditions:	MS <sub>2</sub> (a) has location updated successfully in VPLMN(b). HLR entry for MS <sub>2</sub> (a) contains "O-CSI". [Set by HLR Admin] "ODB-BOICexHC : Active". [Set by HLR Admin]
Action:	MS <sub>2</sub> (a) attempts a call to <i>TestNbr3</i> .
Service logic:	IDP.calledPartyBCDNumber consists of <i>TestNbr3</i> : The SCF alters the destination address to be that of destination number located in country(c). SCF sends CON.
Result:	Successful result if call attempt fails and no announcement or a VPLMN(b) barring announcement is connected to calling party.
Comments:	Unsuccessful result if a call attempt to DN(c) occurs. This test case confirms that any originating CAMEL based service does not violate the invocation of ODB-BOICexHC in case of mobile originated calls.

#### SCP Service Logic

The service behaviour is already described in test case 2.1.8.2

## 2.2 Camel Phase 2

### Originating Service Logic: CAMEL Phase 2



**Figure 14: Entry process for originating service logic: CAMEL Phase 2 (part 1 of 2)**

**Note:** Use Best Fit algorithm to branch into the proper path.

Signals to/from the left  
are to/from the SSP.

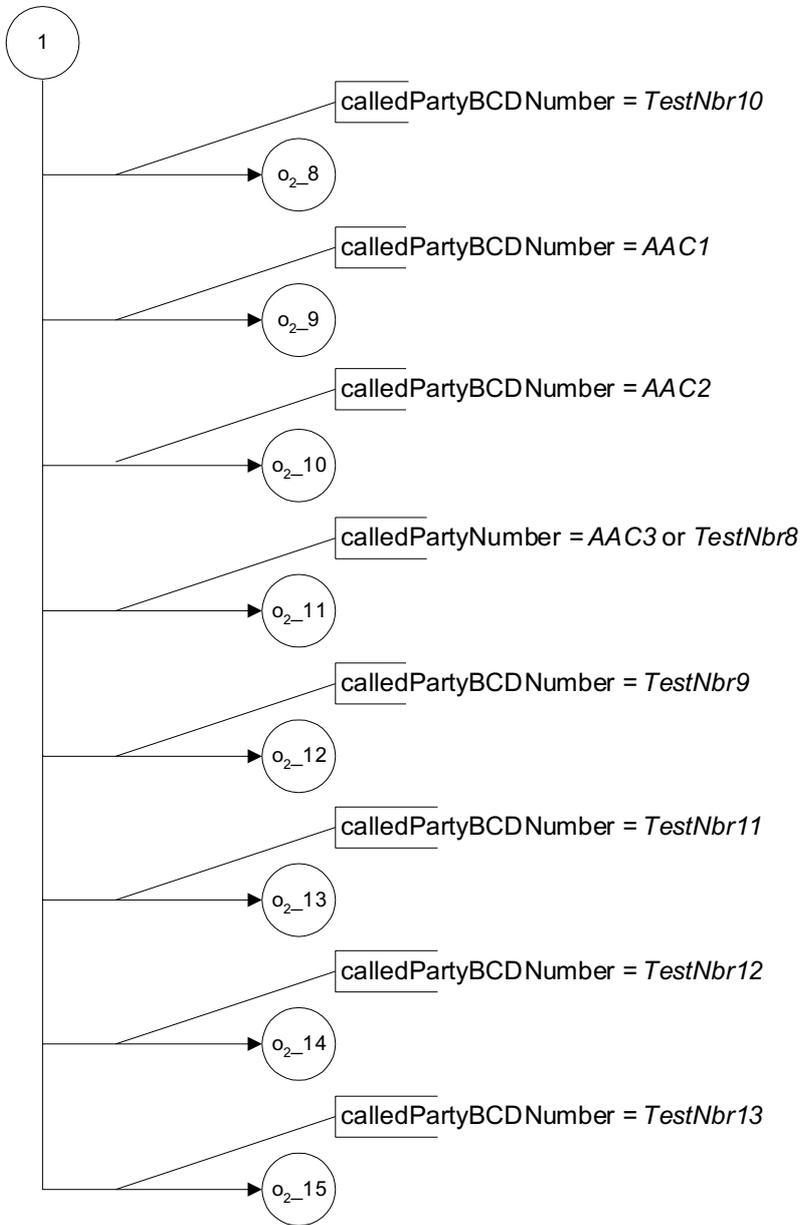


Figure 15: Entry process for originating service logic: CAMEL Phase 2 (part 2 of 2)

Terminating Service Logic: CAMEL Phase 2

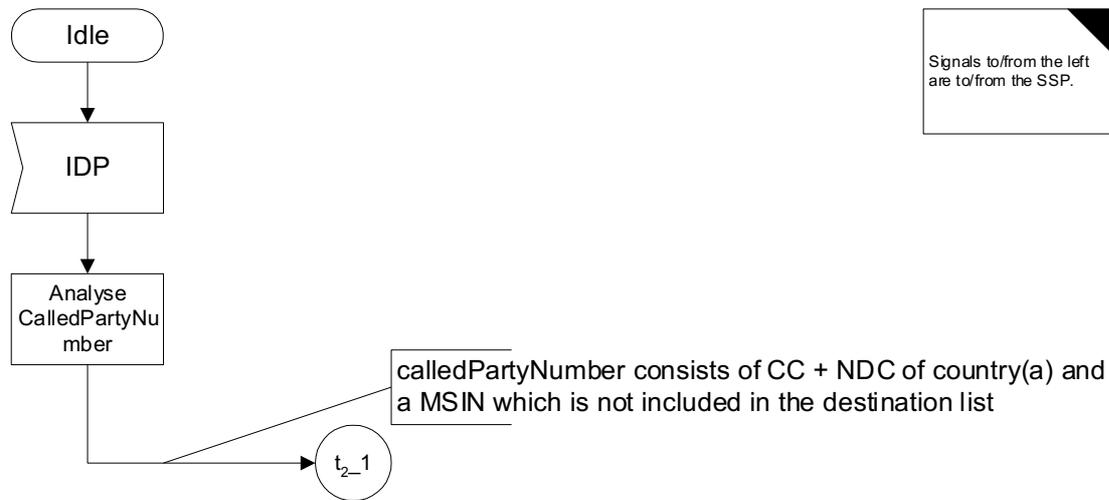
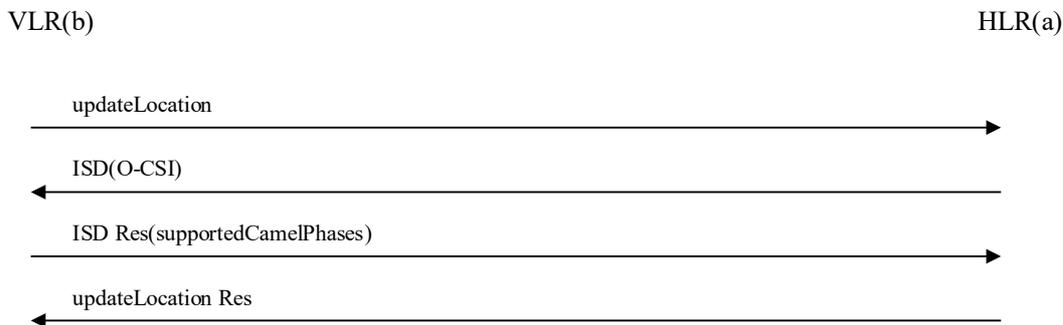


Figure 16: Entry process for terminating service logic: CAMEL Phase 2

### 2.2.1 Location Update

Message-flow:



#### 2.2.1.1 Location Update by MS<sub>4</sub>(a) in VPLMN(b)

Overview:

MS<sub>4</sub>(a) registers in VPLMN(b). The successful insertion of subscriber data – example: O-CSI – in the VLR is verified.

**Preconditions:** MS<sub>4</sub>(a) contains SIM of HPLMN(a).  
 No VLR record exists for MS<sub>4</sub>(a).  
 HLR record contains basic and supplementary service information as well as O-CSI.

**Action:** Power-up MS<sub>4</sub>(a) and perform location registration on VPLMN(b).  
 Check VLR record for the IMSI/MSISDN of MS<sub>4</sub>(a).

**Service logic:** -

**Result:** Successful result if at least the following entries are included in VLR record:

Teleservice TS11	provisioned
SS : BOICexHC	: Provisioned
SS : AoCI	: Provisioned
O-CSI	
TriggerDetectionPoint	<i>CollectedInfo, DP2</i>
CamelCapabilityHandling	<i>CAMEL phase 2</i>
ServiceKey:	equal to information provided by HPLMN(a)
GsmSCFAddress:	equal to information provided by HPLMN(a)
defaultCallHandling:	<i>releaseCall</i>
O-BcsmCamelTDP-CriteriaList	
MatchType	<i>enabling</i>
DestinationNumberLengthList	<i>4</i>
SS-CSI	
ssEventList	= MultiPTY
gsmSCF-Address	

**Comments:** This test case confirms operation of Insert Subscriber Data procedure including O-CSI and that the required subscriber profile for MS<sub>1</sub>(a) is available. If the required subscriber profile is not included in the VLR, the error has to be sorted out before continuation of tests.

SCP Service Logic

The service logic is not involved here.

### 2.2.1.2 Location Update by MS<sub>5</sub>(a) in VPLMN(b)

Overview:

MS<sub>5</sub>(a) registers in VPLMN(b). It is verified, that the required subscriber profile for MS<sub>5</sub>(a) – example.: O-CSI – is available.

Preconditions:	MS <sub>5</sub> (a) contains SIM of HPLMN(a). No VLR record exists for MS <sub>5</sub> (a). HLR record contains basic and supplementary service information as well as O-CSI.
Action:	Power-up MS <sub>5</sub> (a) and perform location registration on VPLMN(b). Check VLR record for the IMSI/MSISDN of MS <sub>5</sub> (a).
Service logic:	-
Result:	Successful result if the following entries are included in VLR record: Teleservice TS11 provisioned ODB-BOICexHC : Active SS : CFNRy : Provisioned O-CSI TriggerDetectionPoint: <i>CollectedInfo, DP2</i> CamelCapabilityHandling <i>CAMEL phase 2</i> ServiceKey: equal to information provided by HPLMN(a) gsmSCFAddress: equal to information provided by HPLMN(a) defaultCallHandling: <i>continueCall</i>
Comments:	This test case confirms that the required subscriber profile for MS <sub>5</sub> (a) is available. If the required subscriber profile is not included in the VLR, the error has to be sorted out before continuation of tests.

### SCP Service Logic

The service logic is not involved here.

## 2.2.2 Check Operation of IDP and DP2 Criteria

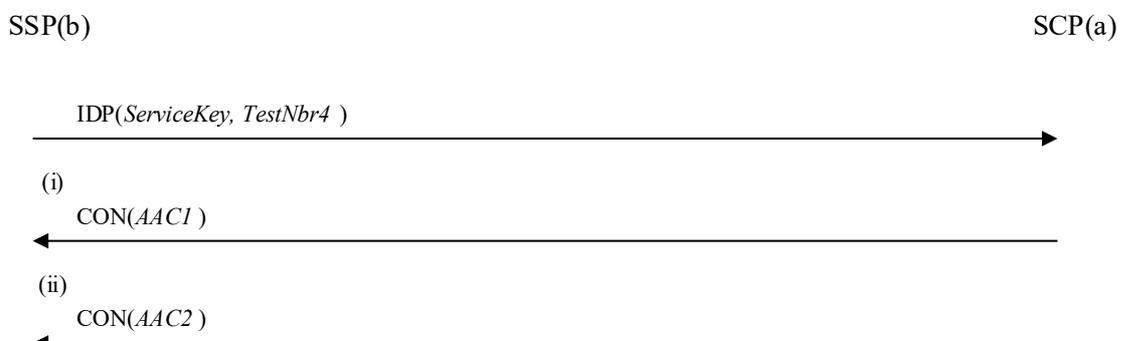
### 2.2.2.1 Called Number of Length Within Destination Number Length List

Overview:

MS<sub>4</sub>(a), registered in VPLMN(b), makes a call to *TestNbr4*. This *TestNbr4* is of a length which is a predefined criteria for the collected\_info trigger detection point for MS<sub>4</sub>(a). Depending on the Initial DP contents, either Test Announcement (*AAC1*) or Test Announcement 2 (*AAC2*) is played. The correct usage of DP criteria is verified.

Or, if the HPLMN does not support DP criteria, an IDP will still be initiated and the contents verified.

Message-flow:



**Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>4</sub>(a) contains "O-CSI, DestinationNumberLengthList = 4, enabling". [Set by HLR Admin]

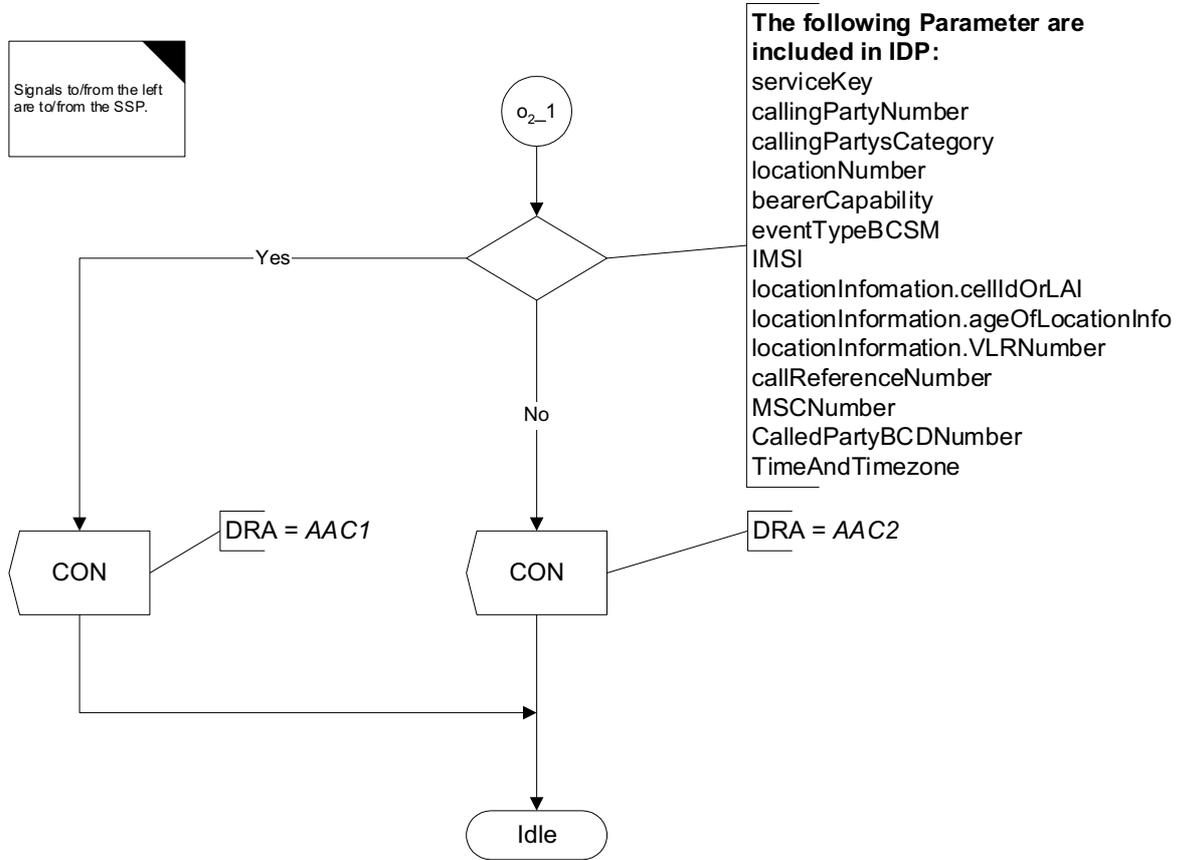
**Action:** MS<sub>4</sub>(a) attempts a call to *TestNbr4*

**Service logic:** IDP calledPartyBCDNumber consists of *TestNbr4*:  
 (i) If SCF received all required parameters within the IDP, the SCF alters the destination address to be that of Test Announcement 1. SCF sends Connect.  
 (ii) If SCF does not receive all parameters within the IDP, the SCF alters the destination address to be that of Test Announcement 2. SCF sends Connect.

**Result:** (i) Successful result if Test Announcement 1 is played to calling party.  
 (ii) If Test Announcement 2 is played to calling party, at least one parameter of the IDP is missing. However, the DP criteria has been successfully implemented.

**Comments:** This test case confirms operation of the TDP criteria and ensures that all parameters are present on the IDP. If no announcement is played, either the criteria for triggering has not been implemented correctly or a fundamental error has occurred. If Test 2.1.2 has been successfully carried out previously, it is likely that the triggering criteria has failed.

SCP Service Logic



**Figure 17: Called Number of Length Within Destination Number Length List**

**Note:** Additional parameter may be included in IDP.

### 2.2.2.2 Called Number Length not Defined by Destination Number Length List

Overview:

MS<sub>4</sub>(a), registered in VPLMN(b) makes a call to AAC4. AAC4 is not within the predefined criteria for the collected\_info trigger detection point for MS<sub>4</sub>(a). No trigger to the SCF should take place.

If a SCF trigger occurs, Test Announcement 2 (AAC2) is played.

If the HPLMN does not support DP criteria, this test is not valid.

Message-flow:

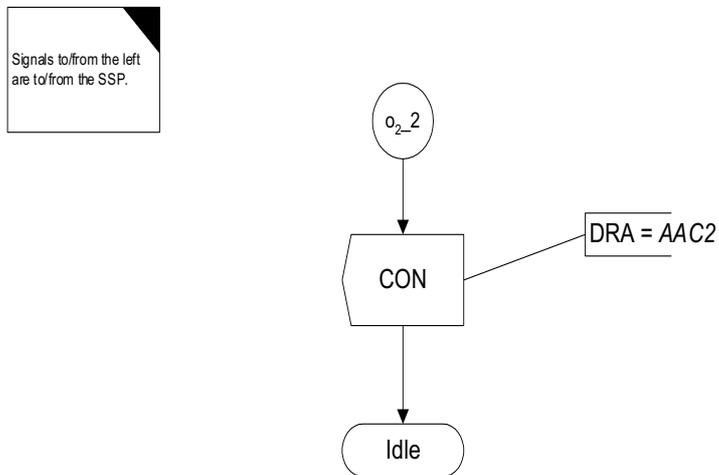


- Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>4</sub>(a) contains "O-CSI, DestinationNumberLengthList = 4, enabling". [Set by HLR Admin].
- Action:** MS<sub>4</sub>(a) attempts a call to AAC4
- Service logic:** (i) There will be no service logic applicable if the triggering criteria has been correctly implemented.
- (ii) However, if the call did trigger a SCF enquiry:  
 The IDP calledPartyBCDNumber consists of AAC4. The SCF alters the destination address to be that of Test Announcement 2.  
 SCF sends Connect.
- Result:** (i) Successful result if the call is routed to the destination of AAC4 .
- (ii) If Test Announcement 2 is played to the calling party, an IDP has been triggered to the SCP, and the test has failed.
- Comments:** This test confirms the operation of the Detection Point criteria when the length of the dialled number is not that in the destination number length list.

## SCP Service Logic

There is no service logic for the successful case of this test.

The service logic for the failure case:



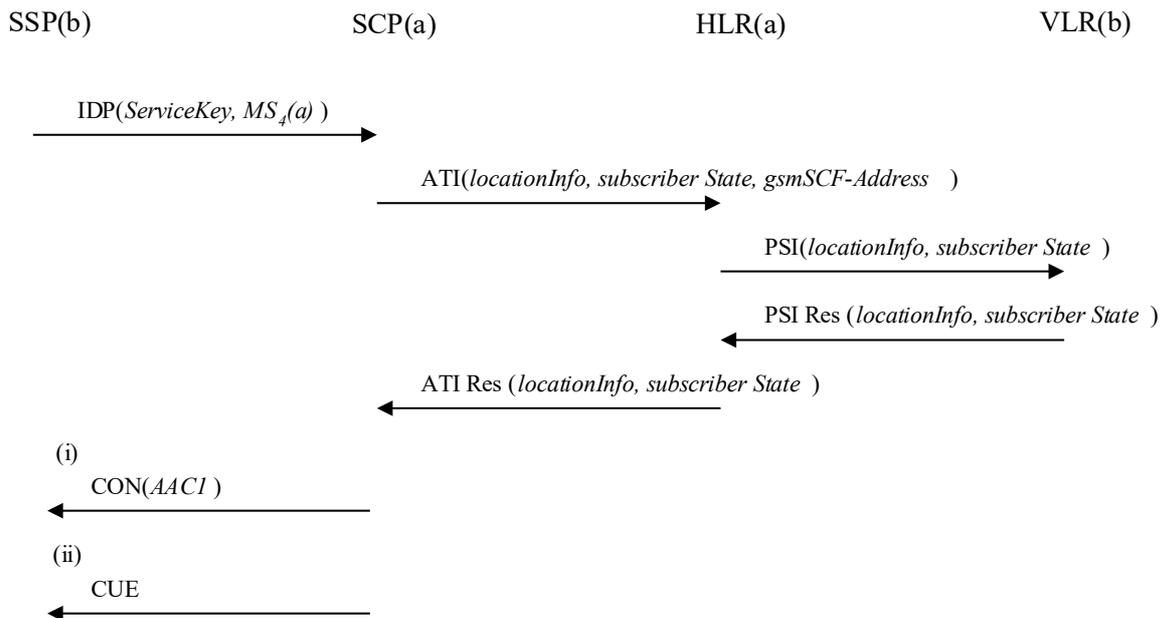
**Figure 18: Called Number Length not Defined by Destination Number Length List**

### 2.2.3 Check operation of PSI

Overview:

MS<sub>5</sub>(a) makes a call to MS<sub>4</sub>(a), both registered in VPLMN(b). Depending on the subscriber state retrieved, either Test Announcement 1 (AAC1) is played or the call is connected. The operation of ProvideSubscriberInfo and the correct reporting of the subscriber state is verified.

Message-flow:



**Preconditions:** MS<sub>4</sub>(a) and MS<sub>5</sub>(a) have location updated successfully in VPLMN(b).  
 HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin]  
 MS<sub>4</sub>(a) is busy.

**Action:** MS<sub>5</sub>(a) attempts a call to MS<sub>4</sub>(a).

**Service logic:** IDP.calledPartyBCDNumber consists of CC+NDC of country (a) and a MSIN which is not included in the destination list:  
 SCF starts Any Time Interrogation and requests Location Information and Subscriber State of MS<sub>4</sub>(a).  
 (i) If subscriber state in Any Time Interrogation Result equals camelBusy, SCF alters destination address to be that of Test Announcement 1 and sends CON.

**Result:** (ii) If subscriber state is any other, SCF sends CUE.  
 Successful result if Test Announcement 1 is played to calling party.  
 If the busy tone is played to calling party, the subscriber state was incorrect.

**Comments:** This test case confirms operation of Provide Subscriber Information to retrieve a correct subscriber state.

SCP Service Logic

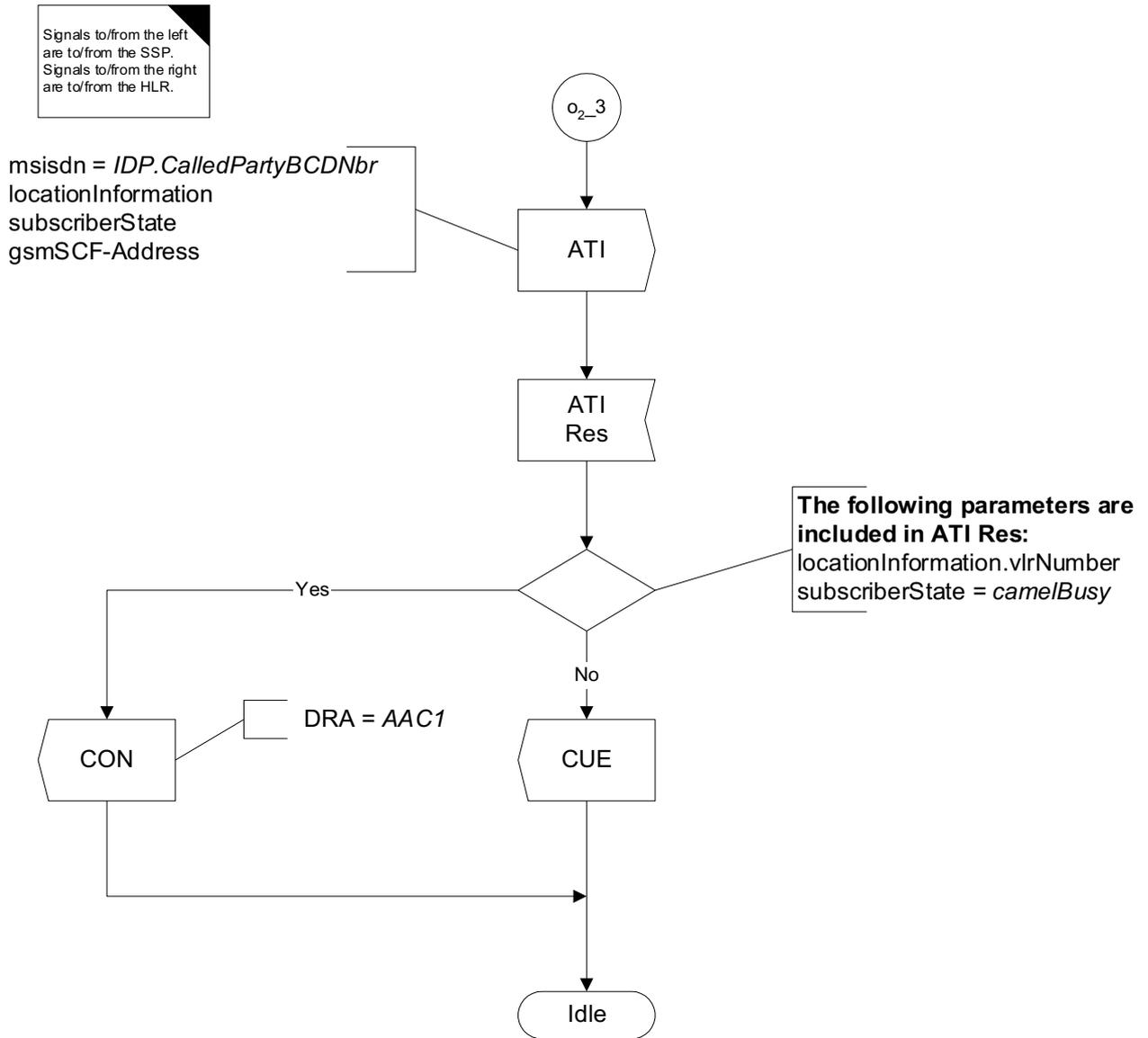


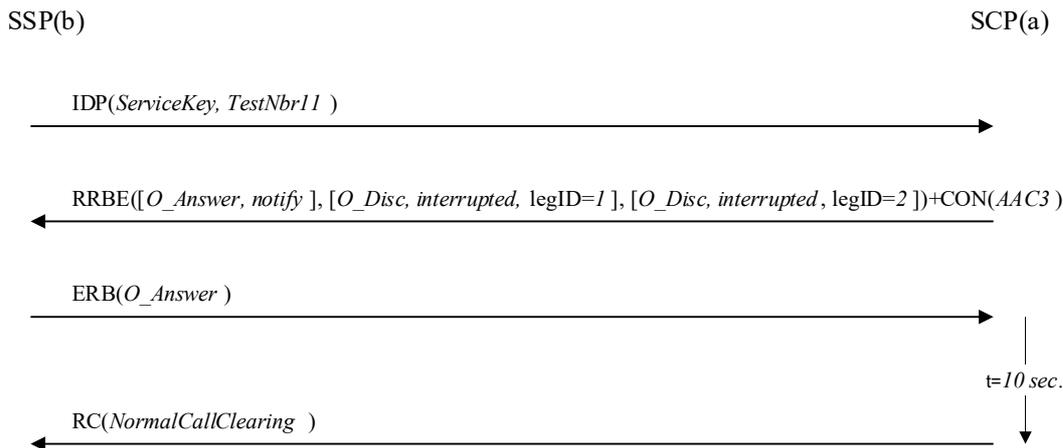
Figure 19: Check operation of PSI

### 2.2.4 Check reporting of EDP O\_Answer, O\_Disconnect and operation of RC

Overview:

MS<sub>5</sub>(a), registered in VPLMN(b), makes a call to *TestNbr11*. 10 seconds after Test Announcement 3 is connected to calling party, the call is released from SCP. The operation of RequestReportBCSMEvent, EventReportBCSM and ReleaseCall is checked.

Message-flow:



- Preconditions:** MS<sub>5</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin]
- Action:** MS<sub>5</sub>(a) attempts a call to *TestNbr11* and waits until the call is disconnected.
- Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr11*:  
 The SCF alters the destination address to be that of Test Announcement 3.  
 SCF sends RRBE([O\_Answer, notify], [O\_Disc, interrupted, legID=1], [O\_Disc, interrupted, legID=2])+CON. After reception of ERB(O\_Answer) SCF starts a timer of length 10 seconds. SCF sends RC after expiration of this timer.
- Result:** Successful result if Test Announcement 3 is played to calling party and the call is released after 10 ±1 seconds from SCP.  
 If the connection to Test Announcement 3 is not disconnected after 10 ± 1 seconds, the test has failed.
- Comments:** This test case checks correctly reporting of EDP-N7, O\_Answer, and the ability to arm EDP-N9, O\_Disconnect. Additionally the operation of RC is checked.

SCP Service Logic

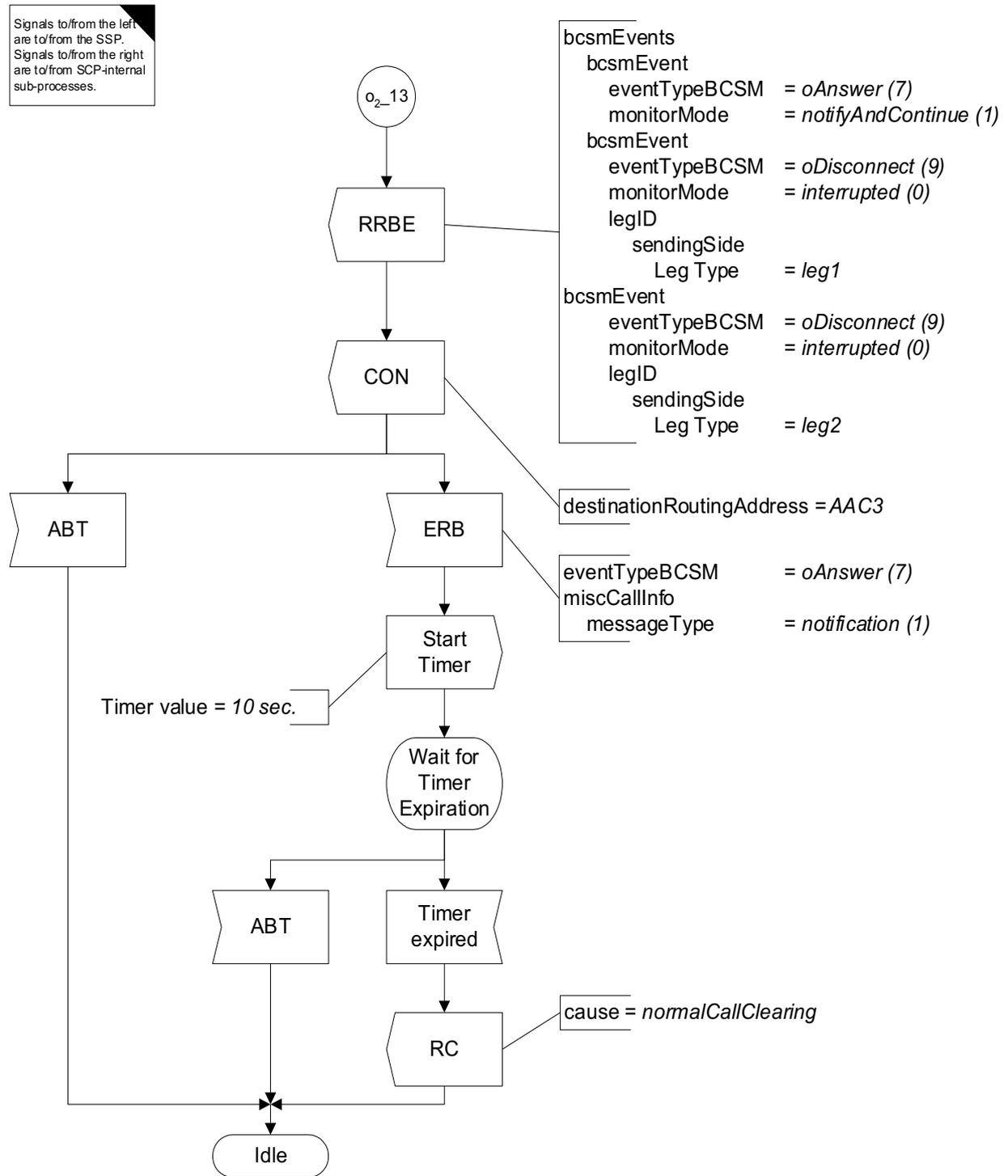
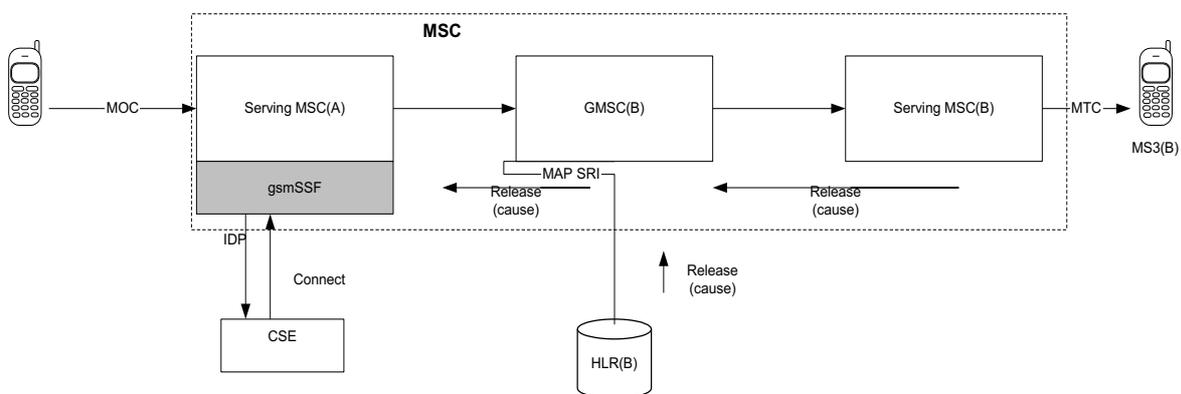


Figure 20: Check reporting of EDP O\_Answer, O\_Disconnect and operation of RC

### 2.2.5 Check operation of CUE and FCI with Follow-On Call

**Note:** This testcase relies on certain release causes (busy, notReachable) to be correctly reported back to the gsmSSF in order to be detected as trigger events. Part 2.2.5.2, 2.2.5.3 and 0 of this test are optional, because they may represent only special cases as far as the capability of the signalling system between or within the networks are concerned. Therefore, the result of the test has to be carefully interpreted.

Generally the MSC functions shown in the picture below can be distinguished. However, during the test it is likely that the MSC where the tester is located will comprise all the functions. As a result, the release causes are only processed internally.



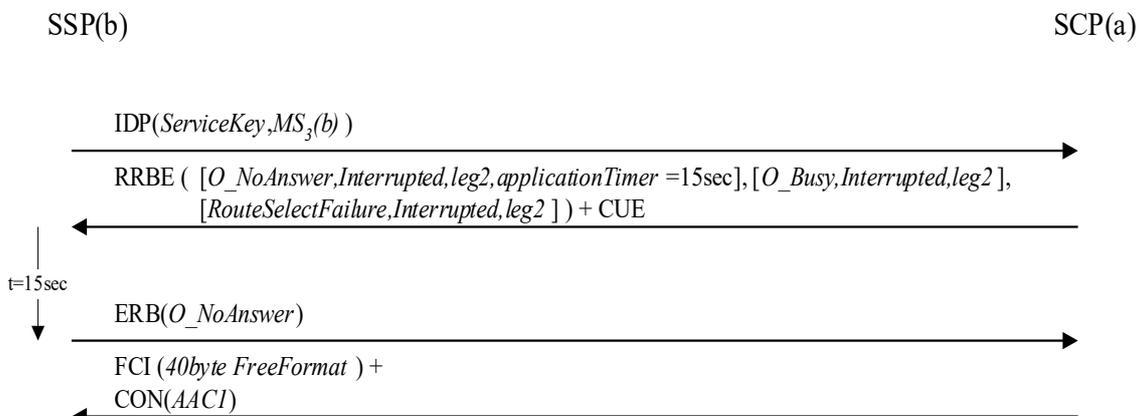
**Figure 21: MSC functions for CUE and FCI with Follow-On Call**

#### 2.2.5.1 Follow-On Call due to "Called Party does not Reply"

Overview:

MS<sub>5</sub>(a) makes a call to a MS<sub>3</sub>(b), which is located in the VPLMN(b) and does not answer the call. After the no-answer timer expires, the Re-connection to Test Announcement 1 (AAC1) is triggered.

Message-flow:



**Preconditions:** MS<sub>5</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin]

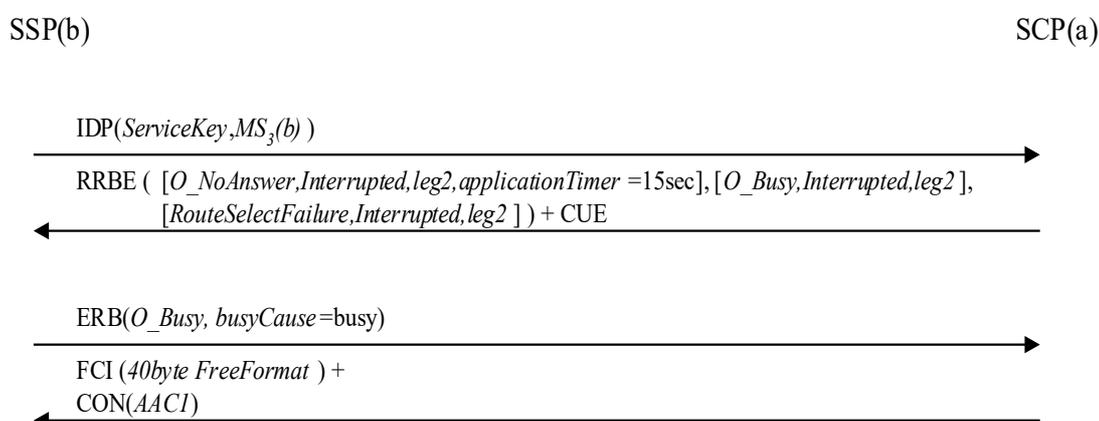
Action:	No GSM CF is active for MS <sub>3</sub> (b). MS <sub>5</sub> (a) attempts a call to MS <sub>3</sub> (b). MS <sub>3</sub> (b) does not answer the call.
Service logic:	CC + NDC of IDP.calledPartyBCDNumber differs from CC + NDC of country (a): SCF sends RRBE ([O_NoAnswer, Interrupted, leg2, 15sec], [O_Busy, Interrupted, leg2], [Route_Select_Failure, Interrupted, leg2])+CUE.
Result:	After reception of ERB(O_NoAnswer) SCF sends transparent charging information through FCI and reconnects to AAC1: FCI (40byte FreeFormat(octet-string), legID=1)+ CON(AAC1)
Comments:	Successful result if Test Announcement 1 is played to calling party. This test case checks arming and correct reporting of EDP-R6, O_NoAnswer, and the ability to reconnect a call while sending transparent charging information. The charging information may optionally contain a cause value indicating the reconnect was due to no answer.

### 2.2.5.2 Follow-On Call due to "Called Party is busy" (optional)

Overview: The same as test case 2.2.5.1 with MS<sub>3</sub>(b) busy.

MS<sub>5</sub>(a) makes a call to a MS<sub>3</sub>(b), which is located in the VPLMN(b) and rendered "busy". Because ISUP is used within the VPLMN or the called MS is registered in the same MSC as the calling MS, the busy cause is received in the SSF and the Re-connection to Test Announcement 1 (AAC1) is triggered on EDP O\_Busy.

Message-flow:



Preconditions:	MS <sub>5</sub> (a) and MS <sub>3</sub> (b) have location updated successfully in VPLMN(b). HLR entry for MS <sub>5</sub> (a) contains "O-CSI". [Set by HLR Admin]. MS <sub>3</sub> (b) is engaged in a call and therefore busy.
Action:	MS <sub>5</sub> (a) attempts a call to MS <sub>3</sub> (b).
Service logic:	CC + NDC of IDP.calledPartyBCDNumber differs from CC + NDC of country (a): SCF sends RRBE ([O_NoAnswer, Interrupted, leg2, 15sec], [O_Busy, Interrupted, leg2], [Route_Select_Failure, Interrupted, leg2])+CUE.
Result:	After reception of ERB(O_Busy) SCF sends transparent charging information through FCI and reconnects to AAC1: FCI (40byte FreeFormat(octet-string), leg1)+ CON(AAC1) Successful result if Test Announcement 1 is played to calling party.

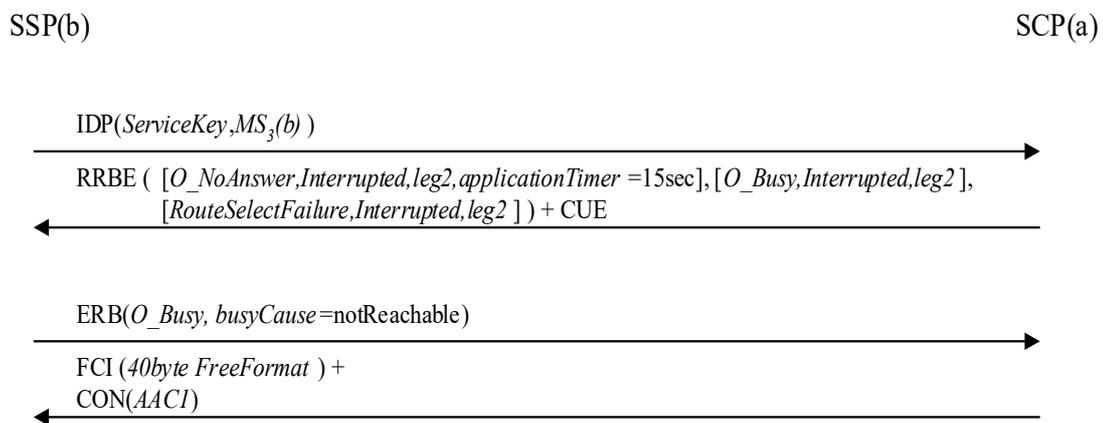
Comments: This test case checks arming and correct reporting of EDP-R5, O\_Busy with indication of busy.  
 The charging information may optionally contain a cause value indicating the reconnect was due to busy.

### 2.2.5.3 Follow-On Call due to "Called Party is NotReachable" (optional)

Overview: The same as test case 2.2.5.1 with MS<sub>3</sub>(b) not reachable.

MS<sub>5</sub>(a) makes a call to a MS<sub>3</sub>(b), which is located in VPLMN(b) and switched off (explicitly detached). Because ISUP is used within the VPLMN or the called MS is registered in the same MSC as the calling MS, the not reachable cause is received in the SSF and the Re-connection to Test Announcement 1 (AAC1) is triggered on EDP Busy.

Message-flow:



**Preconditions:** MS<sub>5</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin]. MS<sub>3</sub>(b) is switched off and therefore not reachable (detached).

**Action:** MS<sub>5</sub>(a) attempts a call to MS<sub>3</sub>(b).

**Service logic:** CC + NDC of IDP.calledPartyBCDNumber differs from CC + NDC of country (a): SCF sends RRBE ( [O\_NoAnswer, Interrupted, leg2, 15sec], [O\_Busy, Interrupted, leg2], [Route\_Select\_Failure, Interrupted, leg2])+CUE.  
 After reception of ERB(O\_Busy, BusyCause=not reachable)) SCF sends transparent charging information through FCI and reconnects to AAC1. FCI (40byte FreeFormat(octet-string), leg1)+ CON(AAC1)

**Result:** Successful result if Test Announcement 1 is played to calling party.

**Comments:** This test case checks arming and correct reporting of EDP-R5, O\_Busy with indication of not reachable.  
 The charging information may optionally contain a cause value indicating the reconnect was due to not reachable.

### 2.2.5.4 Follow-On Call due to "RouteSelectFailure" by "Release before Answer" (optional)

Overview:

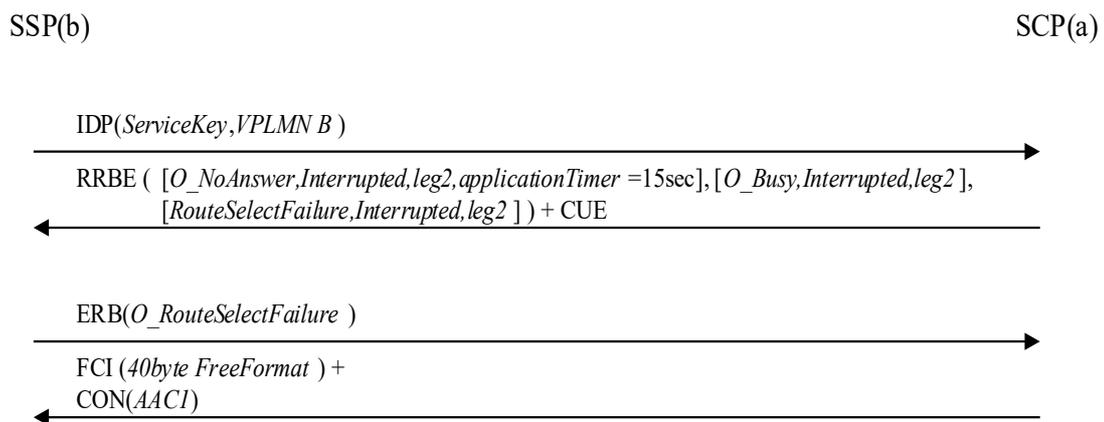
This testcase verifies reporting of the EventDetection Point "Route\_Select\_Failure" to the SCP.

It is not clearly specified whether a network initiated release before answer, e.g. after a network announcement, with cause "normal unspecified" will trigger this DP. In terms of service functionality, this could be the preferred option. The testcase relies on a VPLMN mapping of release "normal unspecified" before answer to the Route\_Select\_Failure DP. It is optional as long as this point is open.

MS<sub>5</sub>(a) makes a call to a number in the numbering range of VPLMN B, which has the following properties: The call to the number is released by the network before Answer/Connect is sent to the MS<sub>5</sub>(a). This may be the case for calls to a number not allocated with an announcement played by the network for a limited time period.

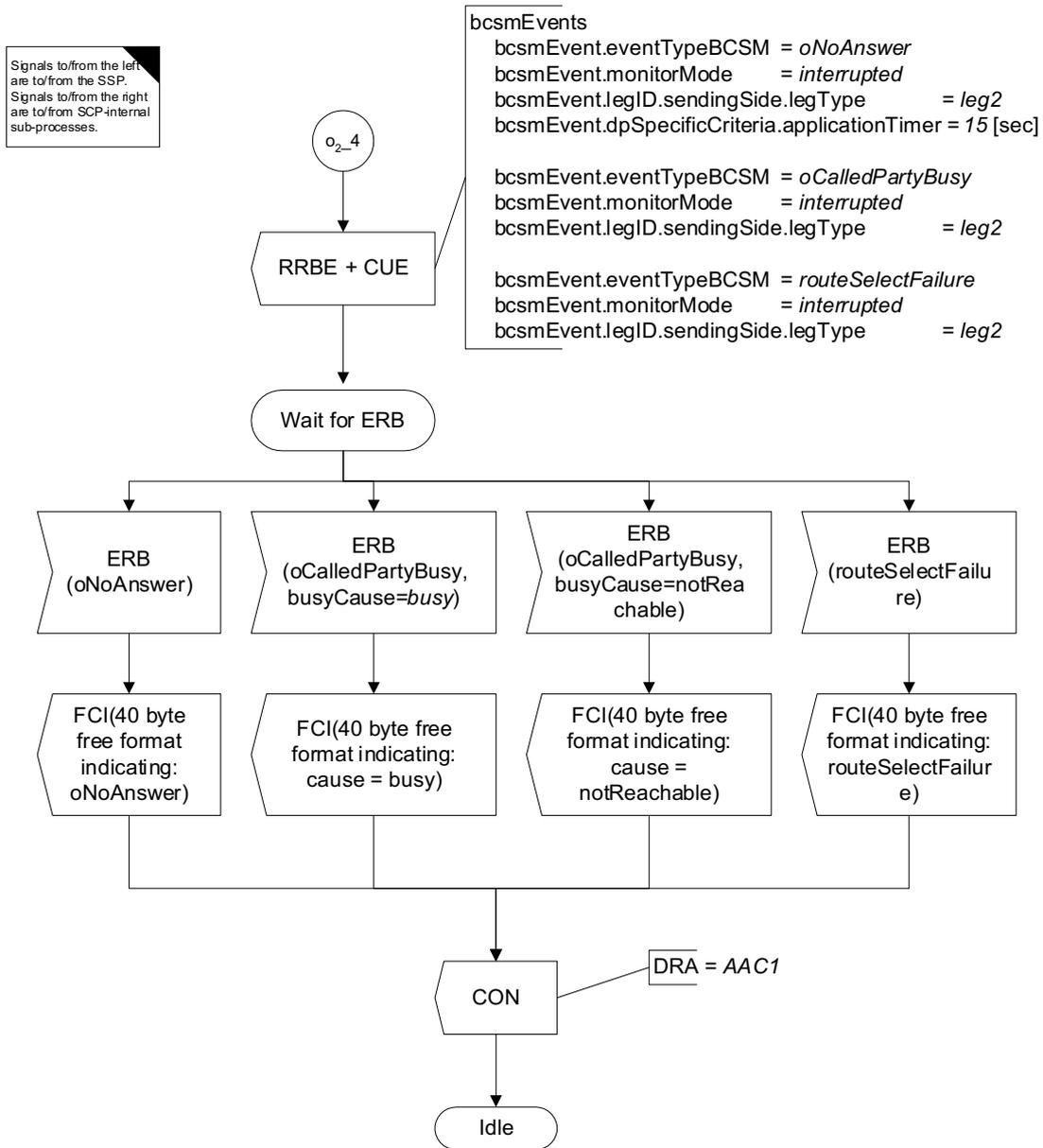
Because ISUP is used within the VPLMN or the called MS is registered in the same MSC as the calling MS, the release cause is received in the SSF and the Re-connection to Test Announcement 1 (AAC1) is triggered on EDP Busy.

Message-flow:



- Preconditions:** MS<sub>5</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin].
- Action:** MS<sub>5</sub>(a) attempts a call to a number in the number range of VPLMN B.  
**Note:** The properties of the number to be dialled are described in the Overview of this test case.
- Service logic:** CC + NDC of IDP.calledPartyBCDNumber differs from CC + NDC of country (a): SCF sends RRBE ( [O\_NoAnswer, Interrupted, leg2, 15sec], [O\_Busy, Interrupted, leg2], [Route\_Select\_Failure, Interrupted, leg2])+CUE.
- After reception of ERB(Route\_Select\_Failure) SCF sends transparent charging information through FCI and reconnects to AAC1. FCI (40byte FreeFormat(octet-string), leg1)+ CON(AAC1)
- Result:** Successful result if Test Announcement 1 is played to calling party.
- Comments:** This test case checks arming and correct reporting of EDP-R4, Route\_Select\_Failure.  
 The charging information may optionally contain a cause value indicating the reconnect was due to RouteSelectFailure.

SCP Service Logic



**Figure 22: Follow-On Call due to "RouteSelectFailure" by "Release before Answer" (optional)**

**2.2.6 Check operation of CIReq, SCI and AC**

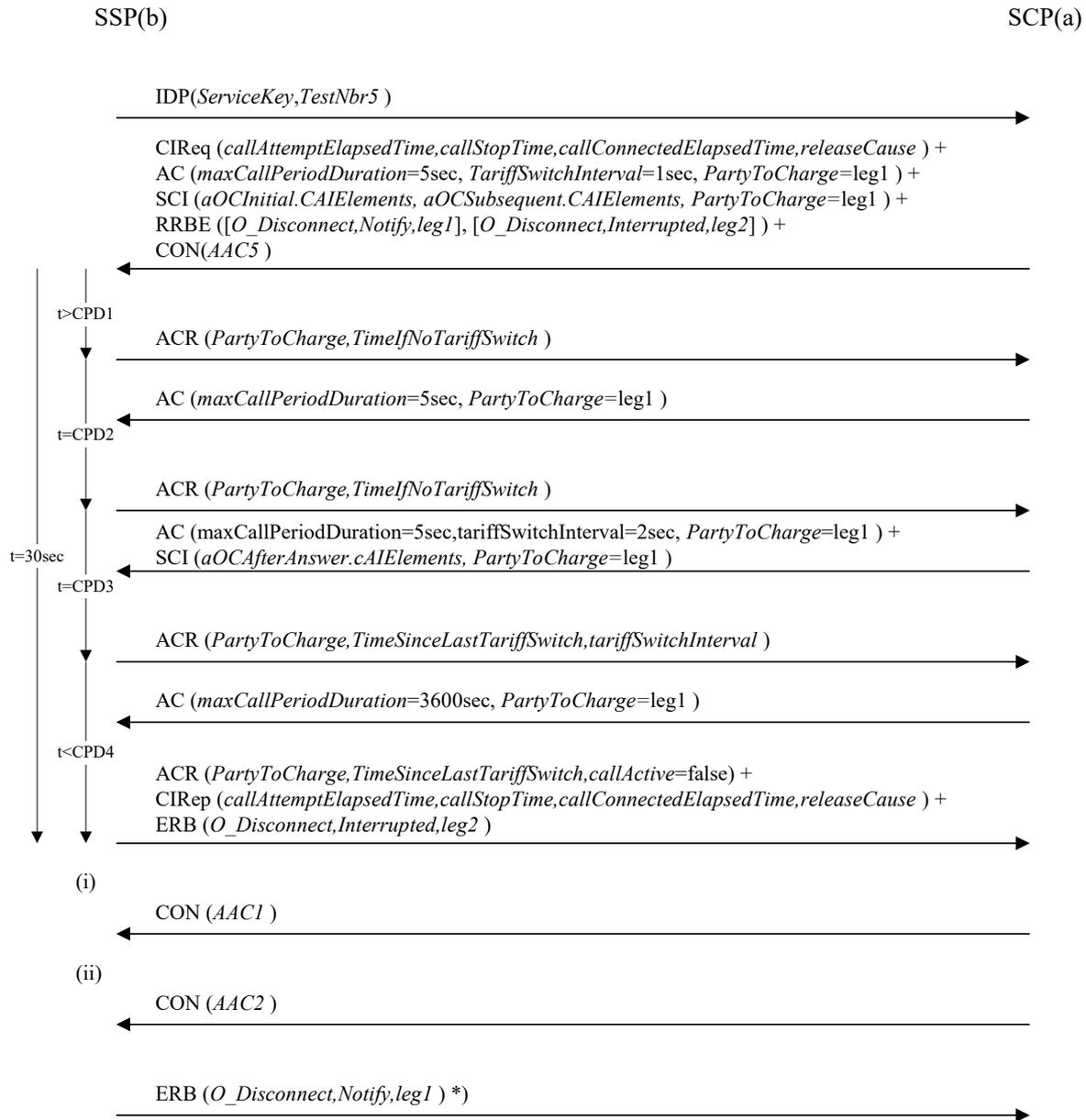
**2.2.6.1 Check correct reporting of call periods (1)**

Overview:

MS<sub>4</sub>(a), registered in VPLMN(b), makes a call to *TestNbr5* and is connected to Test Announcement 5 (AAC5). AAC5 disconnects the call after 30 seconds. Depending on correct

reporting of call periods, either Test Announcement 1 (AAC1) or Test Announcement 2 (AAC2) is played. The operation of CAP-CallInformationRequest/-Report, CAP-SendChargingInfo, CAP-ApplyCharging and CAP-ApplyChargingReport is verified.

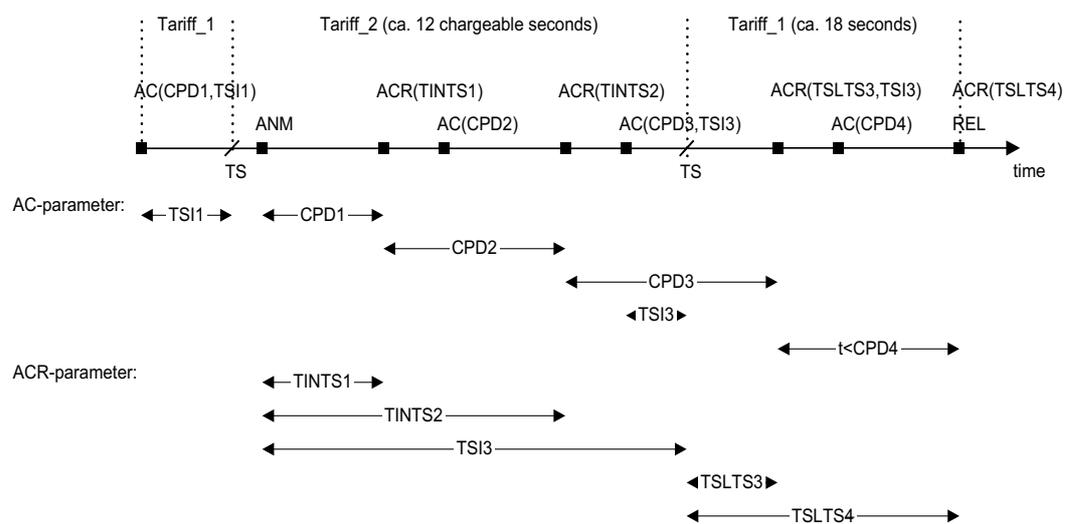
Message-flow:



\*) ERB is sent in case A-party disconnects the call to AAC2.  
 If AAC2 terminates the call ERB is not sent from SSP

**Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>4</sub>(a) contains "O-CSI". [Set by HLR Admin]  
**Action:** MS<sub>4</sub>(a) attempts a call to TestNbr5.  
**Service logic:** IDP.calledPartyBCDNumber consists of TestNbr5:  
 The SCF alters the destination address to be that of Test Announcement 5 and sends CIReq+SCI+AC(CPD=5sec, TSI=1sec)+RRBE+CON. After the first ACR is received AC(CPD=5sec), after the second ACR SCI+AC(CPD=5sec, TSI=2sec) and after the third ACR AC(CPD=3600sec) is sent.

- (i) When SCF has received ERB and if the correct call periods within the ACRs and the correct  $callConnectedElapsedTime = TSI_{ACR} + TSLTS2$  within CIRep was received, the SCF alters the destination address to be that of Test Announcement 1 and establishes a reconnection.
  - (ii) If SCF does not receive the correct values within the ACRs and CIRep, the SCF alters the destination address to be that of Test Announcement 2 and establishes a reconnection.
- Result:**
- (i) Successful result if Test Announcement 1 is played to calling party after about 30 seconds.
  - (ii) If after about 30 seconds Test Announcement 2 is played to calling party, at least one parameter-value of ACR or CIRep was wrong and the test has failed.
- Comments:**
- This test case confirms the correct reporting of four call periods. One tariff switch occurs before answering the call and a second one in the third call period. If AoCI is supported in VPLMN(b) and MS<sub>4</sub>(a) the operation of SCI is checked;  $12 \pm 3$  units should be displayed. Additionally the operation of CIReq/CIRep is tested. The following figure shows a schematic presentation of the AC- and ACR-parameters used in this call scenario:



**Figure 23: Schematic presentation of the AC- and ACR-parameters used in this call scenario**

SCP Service Logic

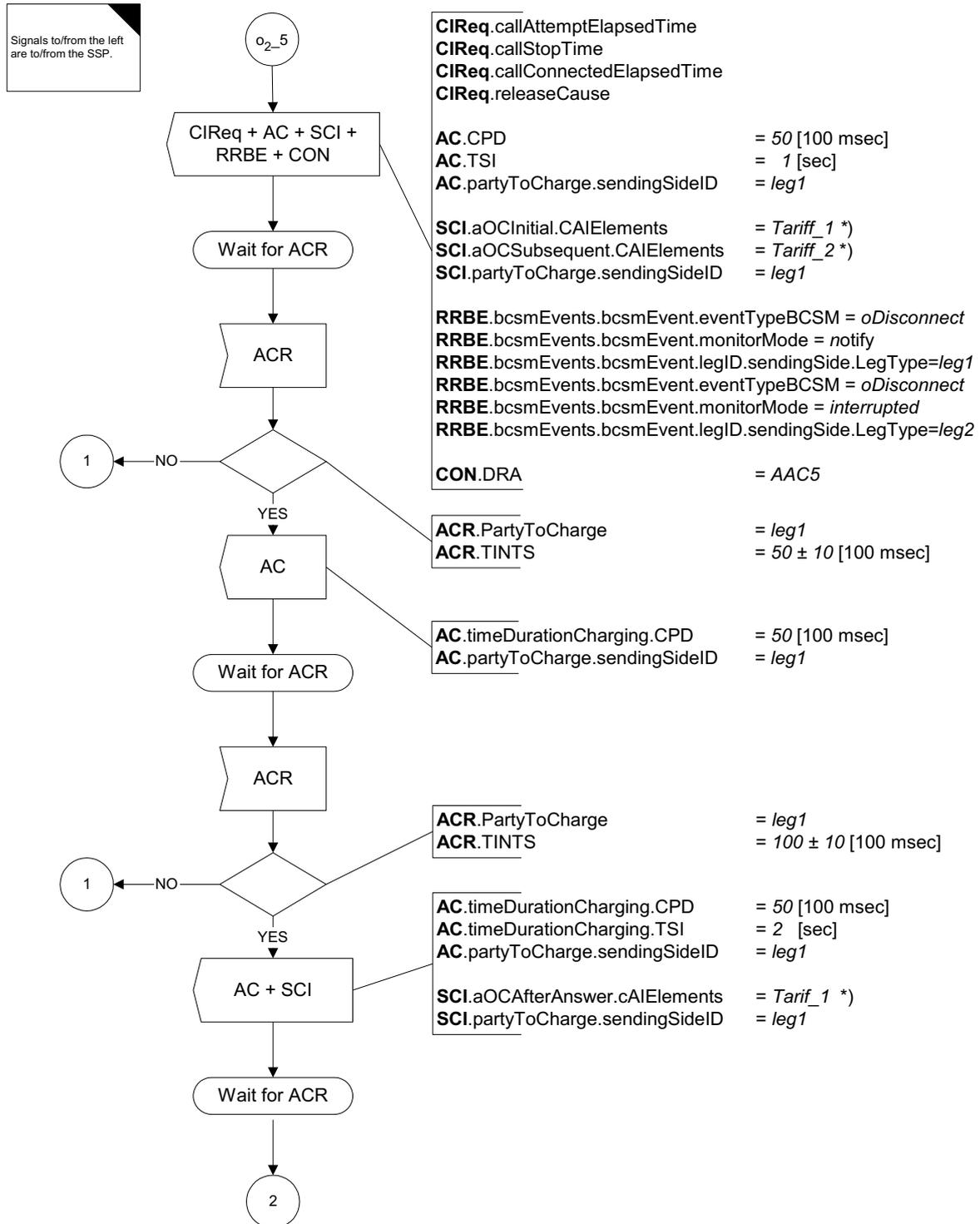
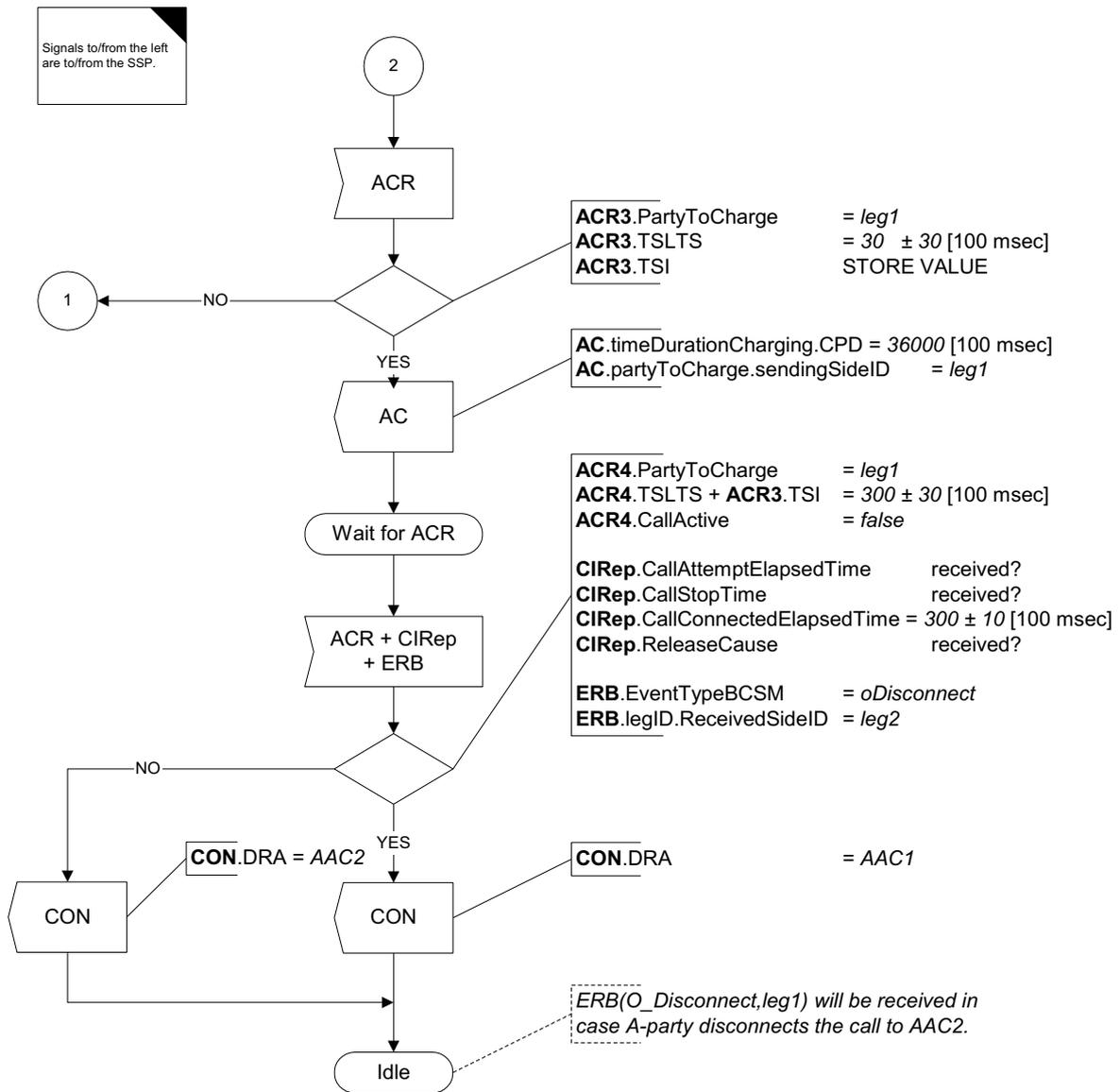


Figure 24: Check correct reporting of call periods (1.1)



**Figure 25: Check correct reporting of call periods (1.2)**

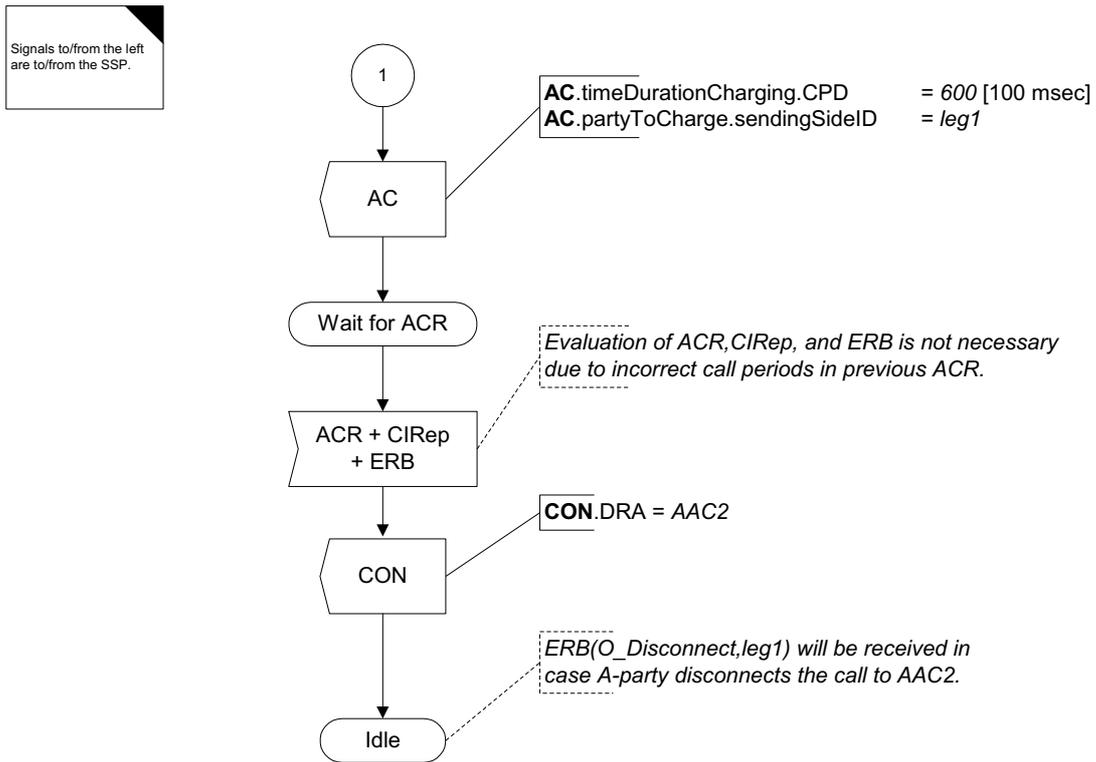


Figure 26:

Figure 27: Check correct reporting of call periods (1.3)

(\*) In the following table the tariffs are specified:

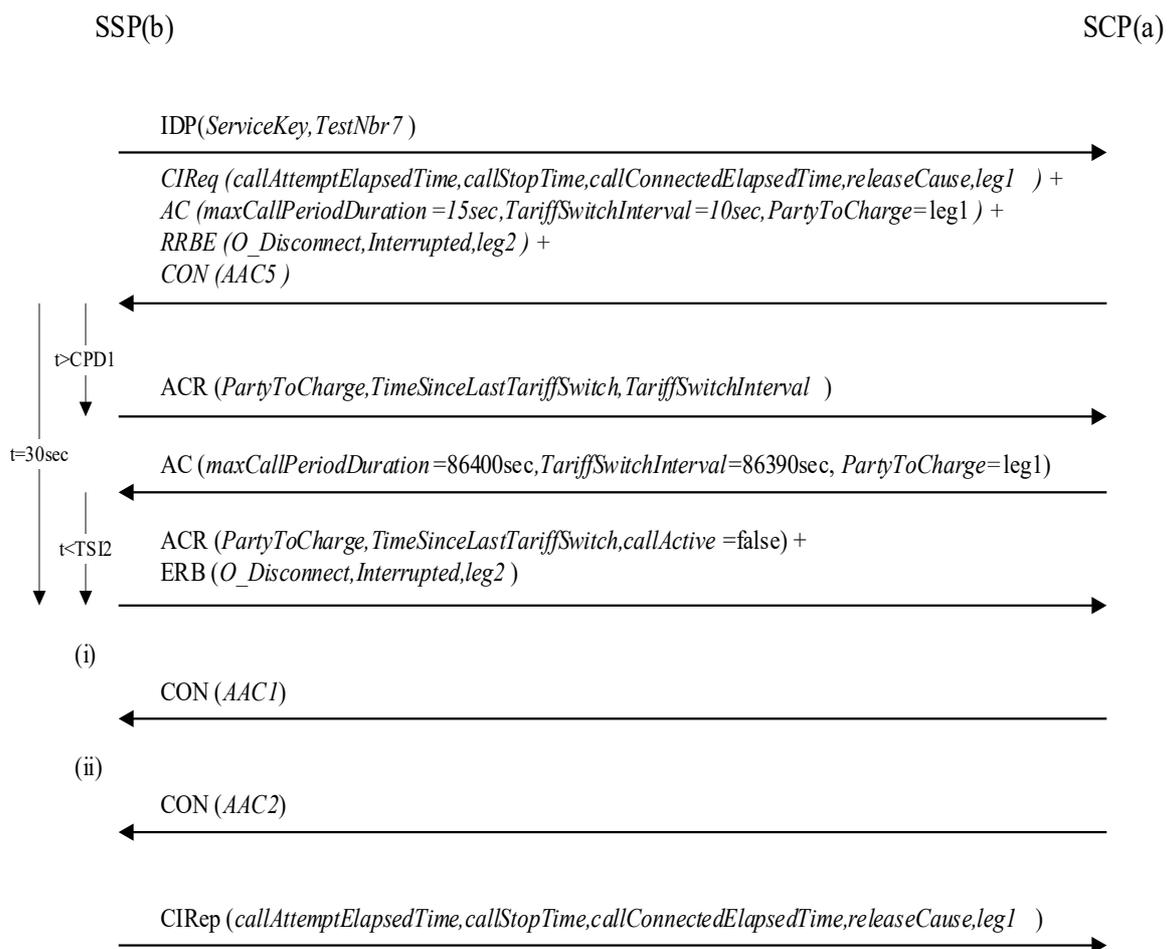
e-parameter	Description	RES	Tariff_1	Tariff_2
e1	Units per interval	0.1	0	1.0
e2	Seconds/time interval	0.1	0	1.0
e3	Scaling Factor	0.01	0	1.00
e4	Unit increment	0.1	0	0
e5	Units per data interval	0.1	0	0
e6	Segments/data interval	1	0	0
e7	Initial secs/t interval	0.1	0	0

### 2.2.6.2 Check reporting of call periods (2)

Overview:

MS<sub>4</sub>(a), registered in VPLMN(b), makes a call to *TestNbr7* and is connected to Test Announcement 5 (AAC5). A tariff switch occurs in the first and in the second Max. Call Period Duration. The call is released before the second tariff switch. Depending on correct reporting of the call periods either Test Announcement 1 (AAC1) or Test Announcement 2 (AAC2) is played.

Message-flow:



**Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>4</sub>(a) contains "O-CSI". [Set by HLR Admin]

**Action:** MS<sub>4</sub>(a) attempts a call to *TestNbr7*.

**Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr7*:  
 The SCF alters the destination address to be that of Test Announcement 5 and sends CIReq+AC(CPD=15sec, TS=10sec)+RRBE+CON. After reception of ACR AC(CPD=86400sec, TS=86390sec) is sent.

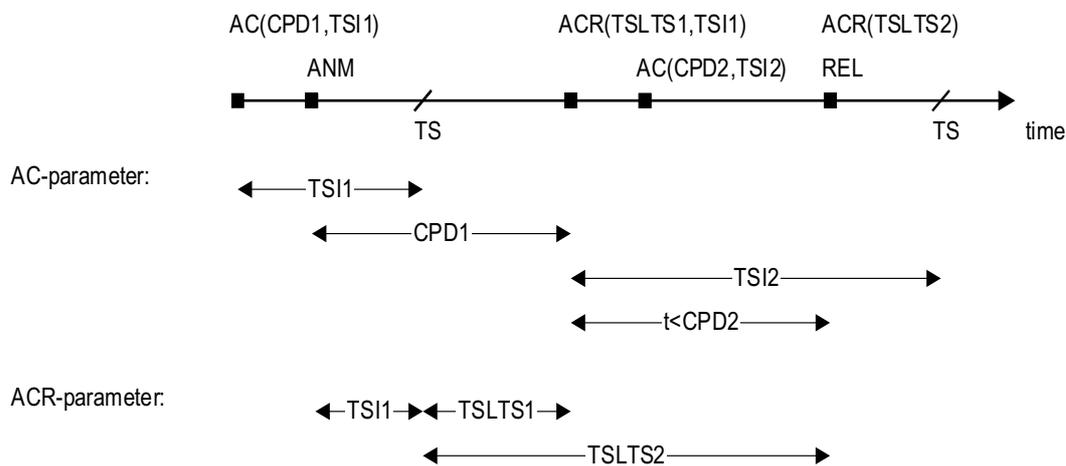
(i) If SCF receives ERB and if the correct call periods within the ACRs was received, the SCF alters the destination address to be that of Test Announcement 1 and establishes a reconnection.

(ii) If SCF does not receive the correct values within the ACRs the SCF alters the destination address to be that of Test Announcement 2 and establishes a reconnection.

**Result:** (i) Successful result if Test Announcement 1 is played to calling party after about 30 seconds.

(ii) If after about 30 seconds Test Announcement 2 is played to calling party, at least one parameter-value of ACRs was wrong and the test has failed.

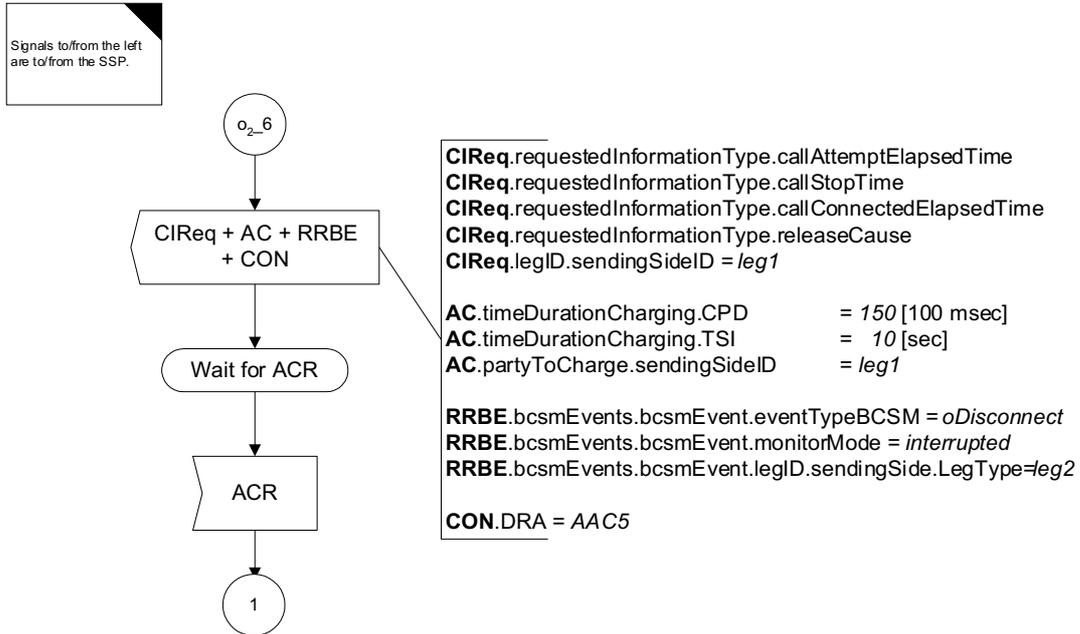
**Comments:** This test case confirms that the call periods are reported correctly in case of a tariff switch in the first and in the second Max. Call Period Duration and a call release before the second tariff switch. It is also possible for the tester to check whether CIREP parameter have been properly reported to the SCP (CallConnectedElapsedTime should be equal to  $TSI_{ACR} + TSLTS2$ ). For this it is necessary to use a protocol analyser. This part of the test case is optional. The following figure shows a schematic presentation of the AC- and ACR-parameters used in this call scenario:



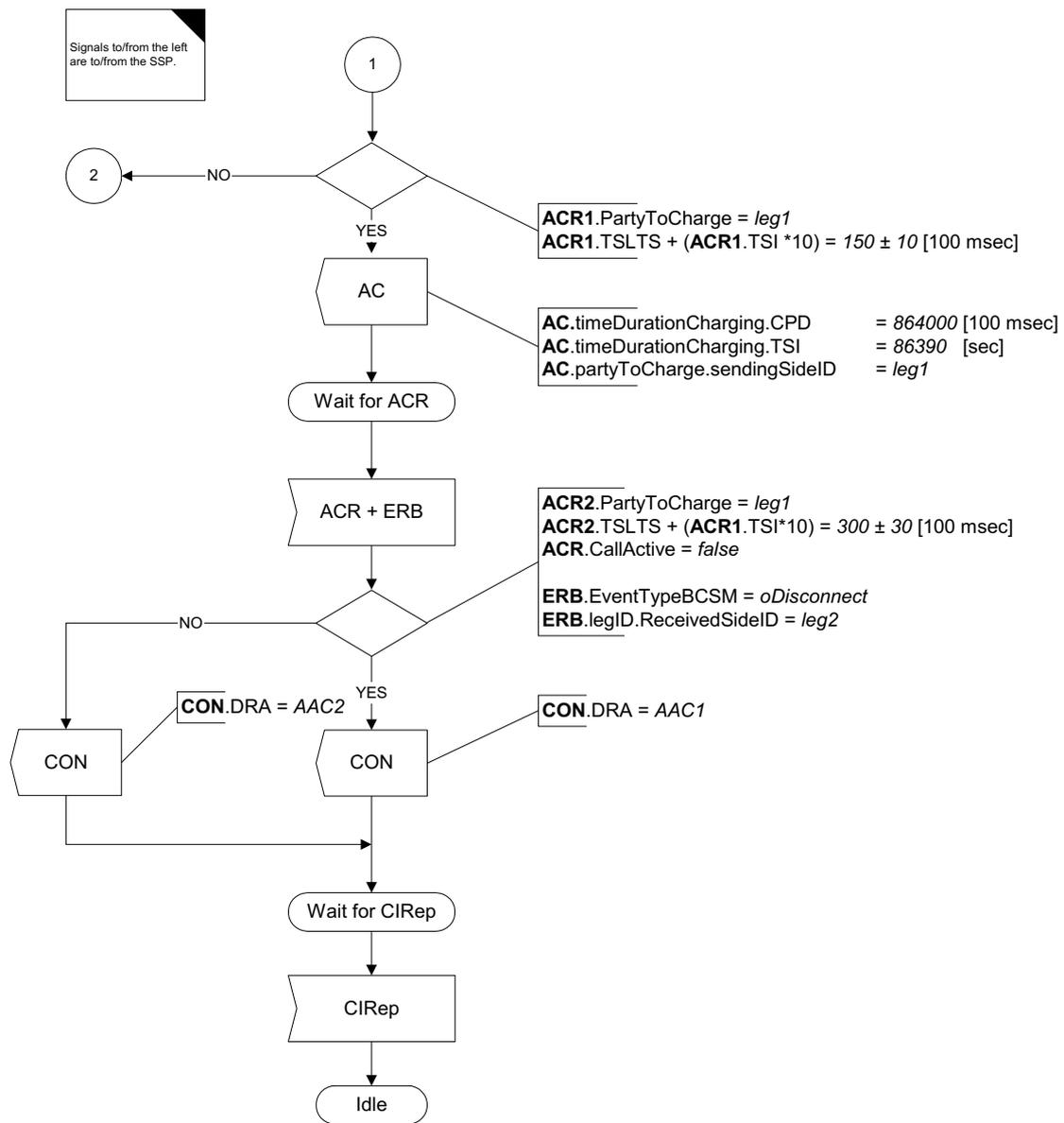
**Figure 28**

**Figure 29: Presentation of the AC- and ACR-parameters**

SCP Service Logic

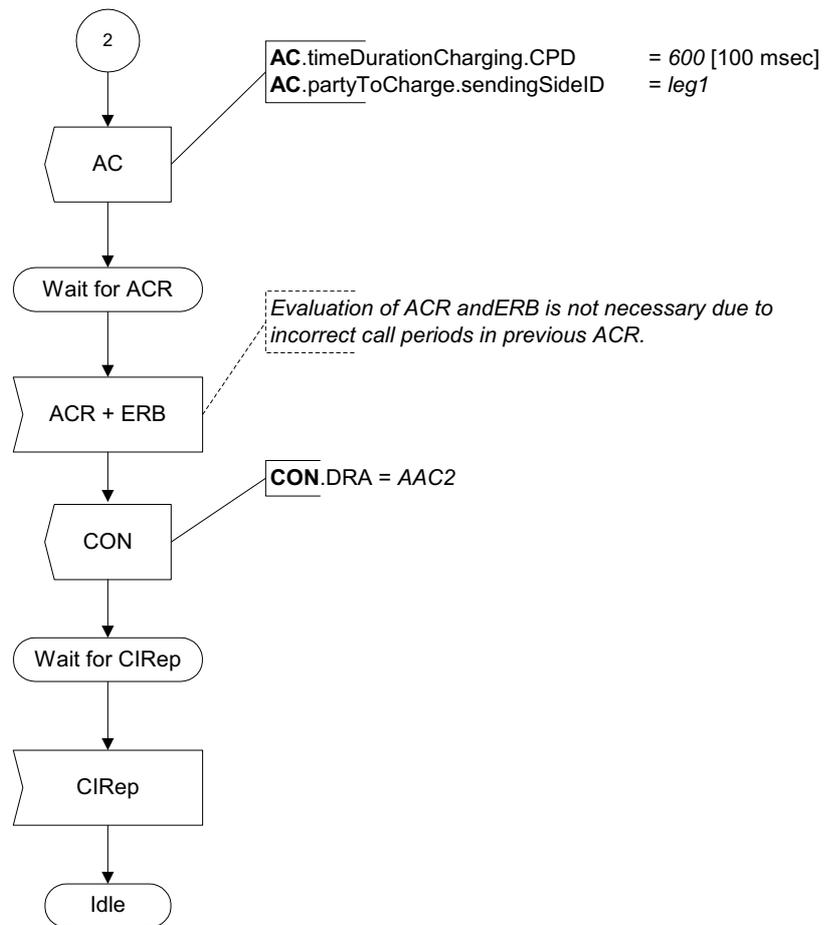


**Figure 30: Check correct reporting of call periods (2.1)**



**Figure 31: Check correct reporting of call periods (2.2)**

Signals to/from the left  
are to/from the SSP.



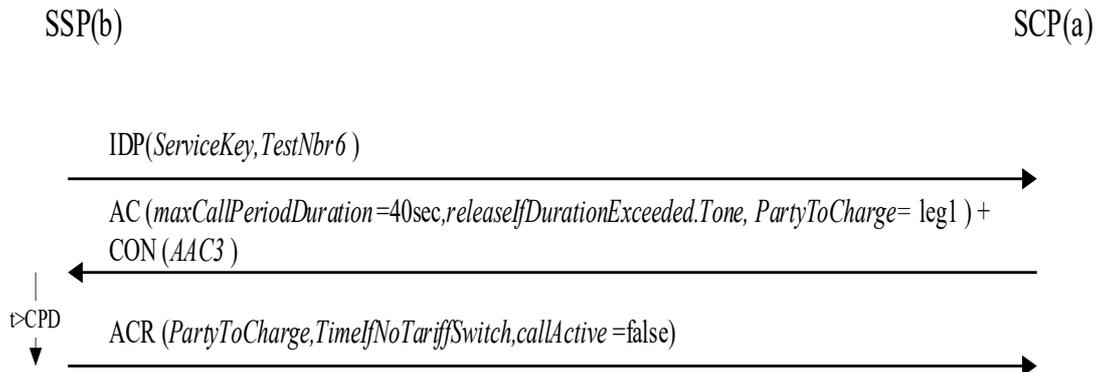
**Figure 32: Check correct reporting of call periods (2.2)**

### 2.2.6.3 Check warning tone and automatic call release

Overview:

MS<sub>4</sub>(a), registered in VPLMN(b), makes a call to *TestNbr6* and is connected to Test Announcement 3 (AAC3). It is checked, that the call is disconnected because of used up credit and if a warning tone is played before the call is released.

Message-flow:



- Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>4</sub>(a) contains "O-CSI". [Set by HLR Admin]
- Action:** MS<sub>4</sub>(a) attempts a call to *TestNbr6*.  
 Check if a warning tone is played to calling party after about 10 seconds.
- Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr6*:  
 The SCF alters the destination address to be that of Test Announcement 3 and sends AC(CPD=40sec, RIDE.Tone) and CON.
- Result:** Successful result if the call is automatically released after 40±1 seconds.
- Comments:** This test case confirms that the call is released from VMSC in case credit is used up and that a warning tone is played.  
 Due to CAMEL phase 2 a warning tone should be played 30 seconds before maxCallPeriodDuration expires, if the parameter "releaseIfDurationExceeded.Tone = true" is included in ApplyCharging message.

SCP Service Logic

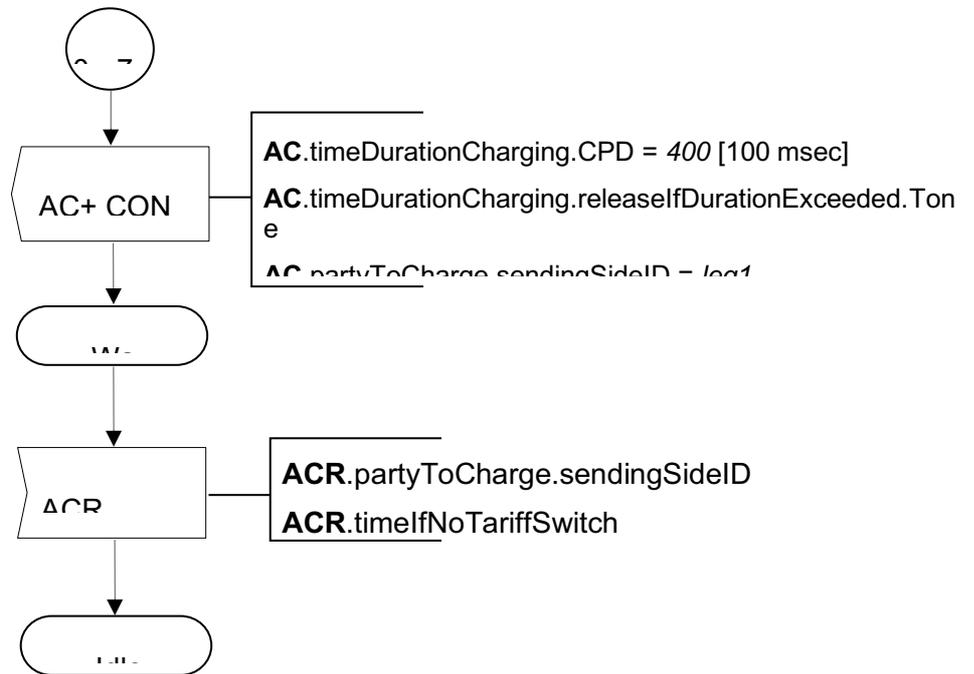


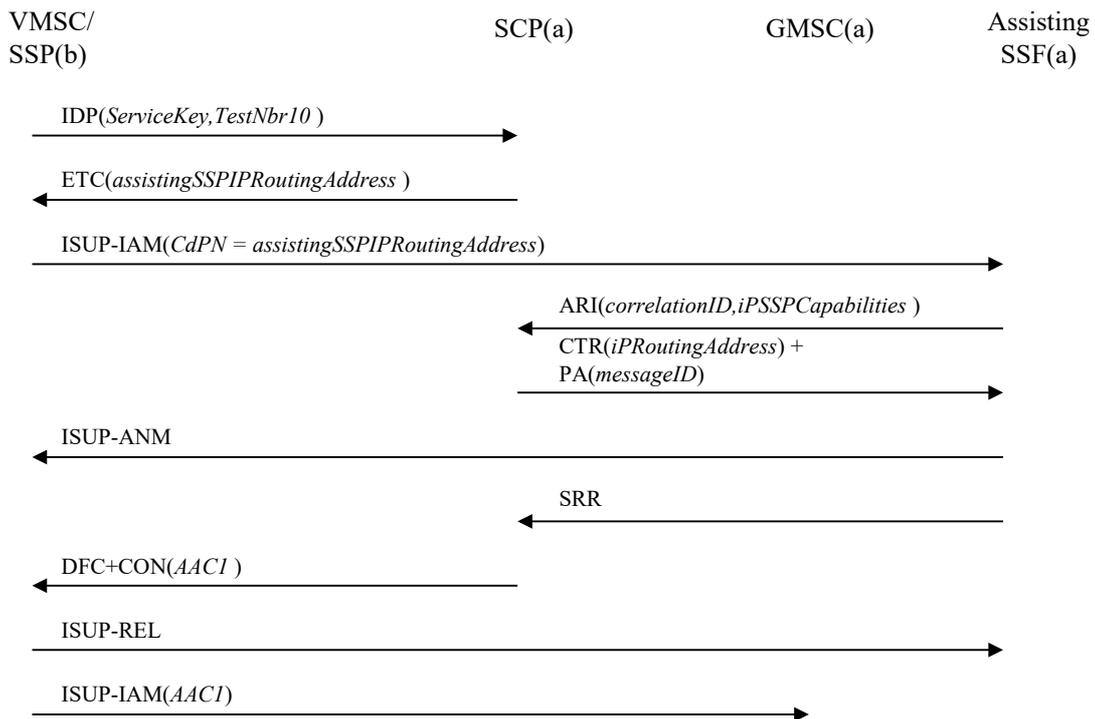
Figure 33: Check warning tone and automatic call release

### 2.2.7 Check operation of ETC and DFC

Overview:

MS<sub>4</sub>(a), registered in VPLMN(b), makes a call to *TestNbr10* and is connected to an IN announcement located in Assisting SSF(a). In case of success Test Announcement 1 (AAC1) is played to calling party.

Message-flow:



- Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b). HLR entry for MS<sub>4</sub>(a) contains "O-CSI". [Set by HLR Admin]
- Action:** MS<sub>4</sub>(a) attempts a call to *TestNbr10*.
- Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr10*:  
 SCP sets up connection to assisting SSF using the operations ETC, CTR and PA. After reception of ARI the SCP instructs the assisting SSF to play a PLMN(a) specific IN-announcement via CTR+PA. An announcement completed indication (SRR) triggers the service logic to clear the connection to the assisting SSF and to connect to test announcement 1: DFC+CON(AAC1).
- Result:** Successful result if calling party is first connected to an PLMN(a) specific announcement and secondly to AAC1.
- Comments:** This test case confirms the operation of the assist procedure, in detail the operation of ETC and DFC. A prerequisite for this IR test is that the operations ARI, CTR, PA and SRR are tested within PLMN(a) and that they work properly.  
 PLMN(a) is responsible to choose a proper IN-announcement and to set up a proper assistingSSPIPRoutingAddress which will be converted into the CdPA used in the IAM to set up the call from the SSP(b) to the

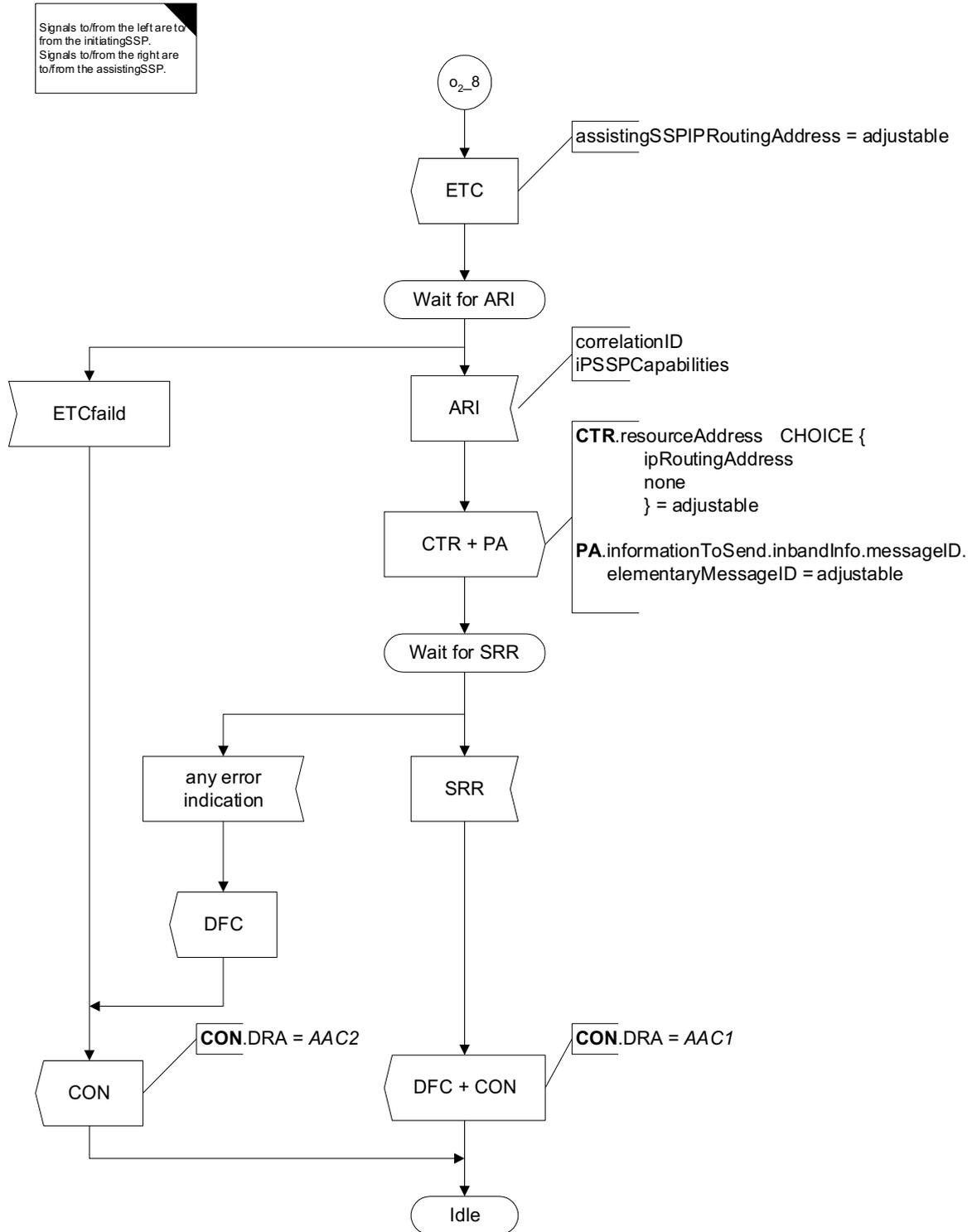
assisting SSF(a). HPLMN(a) may use a SRF instead of an assisting SSF. In this case a CTR-message should not be sent.

It is expected that most networks will not be introducing ISUP2000 for several years. Therefore it is not possible to use separate ISUP parameters for the individual ETC parameters. As a result it is anticipated that the CdPA will be a concatenation of the SRFid, SCFid and CorrelationId. It is therefore also expected that the ETC parameter assistingSSIPRoutingAddress will in effect contain within its digit string (the routing to the HPLMN's SRFs), the SRFid, the SCFid and the CorrelationId.

This CdPA must be assigned from part of the HPLMN's numbering range to allow the call to the SRF to reach the HPLMN. Accordingly international and transit operators will expect the number length to conform with the number plan of the HPLMN country and specifically to that part of the number plan assigned to the HPLMN. Excess digits can be expected to be truncated even though the CdPA conforms to the 15-digit limit expressed in E.164.

Therefore it is important that the HPLMN's SCP constructs the contents of the parameters of the ETC recognising these issues and constraints.

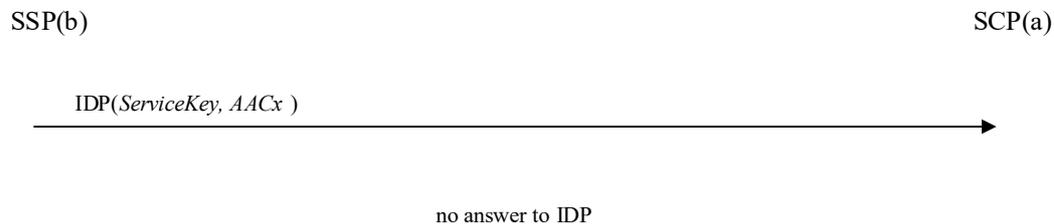
SCP Service Logic



**Figure 34: Check operation of ETC and DFC**

## 2.2.8 Check Default Call Handling

Message-flow:



### 2.2.8.1 defaultCallHandling set to continueCall

Overview:

MS<sub>5</sub>(a), roaming in VPLMN(b), makes a call to Test Announcement 1. SCP does not answer to InitialIDP. The Default Call Handling of MS<sub>5</sub>(a) equals *continueCall*. The call is connected to Test Announcement 1. The correct utilisation of the Default Call Handling is verified.

Preconditions:	MS <sub>5</sub> (a) has location updated successfully in VPLMN(b). HLR record of MS <sub>5</sub> (a) contains O-CSI with parameter defaultCallHandling set to <i>continueCall</i> . [Set by HLR Admin]
Action:	MS <sub>5</sub> (a) attempts a call to AAC1.
Service logic:	IDP.calledPartyBCDNumber equals AAC1: SCF does not answer to IDP. Alternatively SCF may send an Abort message.
Result:	Successful result if Test Announcement 1 is played to calling party.
Comments:	This testcase checks the correct utilisation of the O-CSI parameter defaultCallHandling= <i>continueCall</i> . Some SCF implementations do not allow to send no answer to IDP. In this case SCP should send an Abort message, which triggers the default call handling in the SSF.

### 2.2.8.2 defaultCallHandling set to releaseCall

Overview:

MS<sub>6</sub>(a), roaming in VPLMN(b), makes a call to AAC2. SCP does not answer to InitialDP. The Default Call Handling of MS<sub>6</sub>(a) equals *releaseCall*. The call is released. The correct utilisation of the Default Call Handling is verified.

Preconditions:	MS <sub>6</sub> (a) has location updated successfully in VPLMN(b). HLR record of MS <sub>6</sub> (a) contains O-CSI with parameter defaultCallHandling set to <i>releaseCall</i> . [Set by HLR Admin]
Action:	MS <sub>6</sub> (a) attempts a call to AAC2.
Service logic:	IDP.calledPartyBCDNumber equals AAC2: SCF does not answer to IDP. Alternatively SCF may send an Abort message.
Result:	Successful result if call is <b>NOT</b> established and Test Announcement 2 is <b>NOT</b> played to calling party.
Comments:	This test case checks the correct utilisation of the O-CSI parameter defaultCallHandling= <i>releaseCall</i> . Some SCF implementations do not allow to send no answer to IDP. In this case SCP should send an Abort message, which triggers the default call handling in the SSF.

SCP Service Logic



Figure 35

Figure 36: defaultCallHandling set to releaseCall

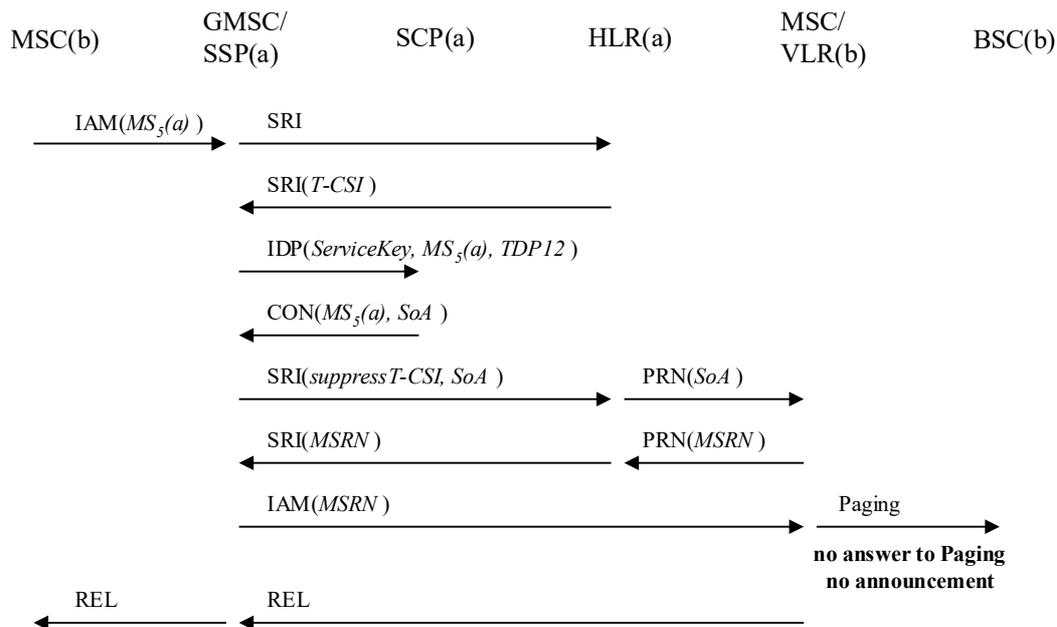
**Note:** In case SCP implementation does not allow to send no answer to IDP an Abort message should be sent.

### 2.2.9 Check Suppression Of Announcement

Overview:

MS<sub>3</sub>(b) makes a call to MS<sub>5</sub>(a), both registered in PLMN(b). SCP instructs VPLMN(b) to suppress announcements. The correct utilisation of the parameter SuppressionOfAnnouncement is verified.

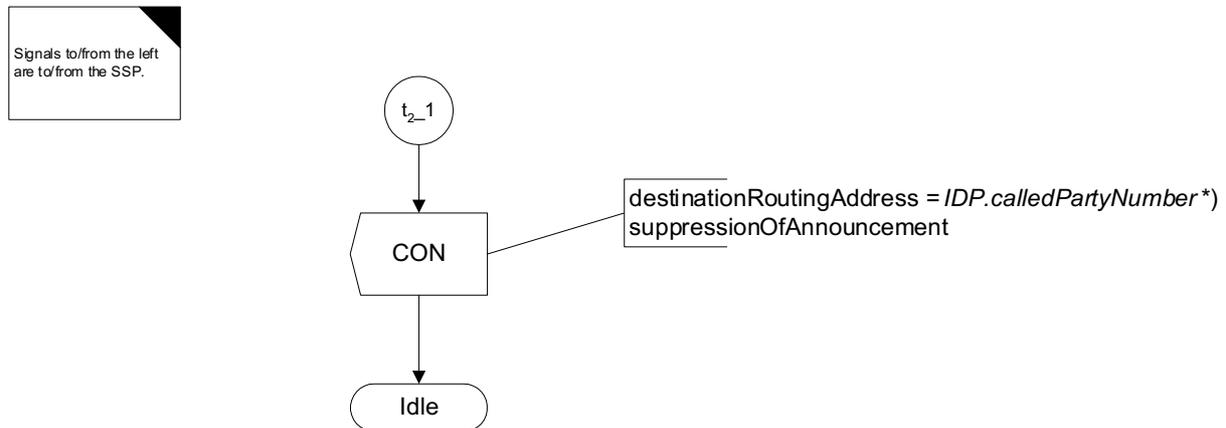
Message-flow:



- Preconditions:** MS<sub>5</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b).  
 HLR entry for MS<sub>5</sub>(a) contains "T-CSI". [Set by HLR Admin]  
 No GSM Call Forwarding is active for MS<sub>5</sub>(a).
- Action:** MS<sub>5</sub>(a) takes battery off in order to provoke unsuccessful call establishment detected in VMSC.  
 MS<sub>3</sub>(b) attempts a call to MS<sub>5</sub>(a).
- Service logic:** IDP.calledPartyNumber consists of CC+NDC of country(a) and a MSIN which is not included in the destination list.  
 SCF sends CON with all parameters unchanged, including SoA Information Element.
- Result:** Successful result if no announcement or the announcement of HPLMN is played to calling party.  
 Unsuccessful result if an announcement of VPLMN(b) is played to calling party.
- Comments:** This test case confirms operation of the suppression of announcement in case of unsuccessful call establishment detected at the VMSC.
- NOTES** 1: In some PLMNs the connection is released because of a timeout on the ISUP interface. This event is not visible to the tester and the test case seems to be passed. The result of this test case is only reliable, if test case 2.1.8.1 or the test case "Call Forwarding on Not Reachable before IMSI detached", specified in IREG PRD IR24, is successful.

2: The outcome of the test case is only reliable in case PLMN(b) plays an announcement on no paging response while SoA is not invoked.

## SCP Service Logic



**Figure 37: Check Suppression Of Announcement**

**\*Note:** The number format (natureOfAddressIndicator, ...) of the destinationRoutingAddress has to be the same as the number format of IDP.calledPartyNumber. In case the number format is changed, the GMSC/SSP(a) may decide that the destination has changed and that a HLR interrogation for the new destination (SRI without the parameter suppress T-CSI) is started. This may lead into a loop.

## 2.2.10 Interaction with GSM Supplementary Services and ODB

To keep the expenditure low, interaction with the GSM supplementary services Call Forwarding, Call Barring and Operator Determined Barring is tested exemplary.

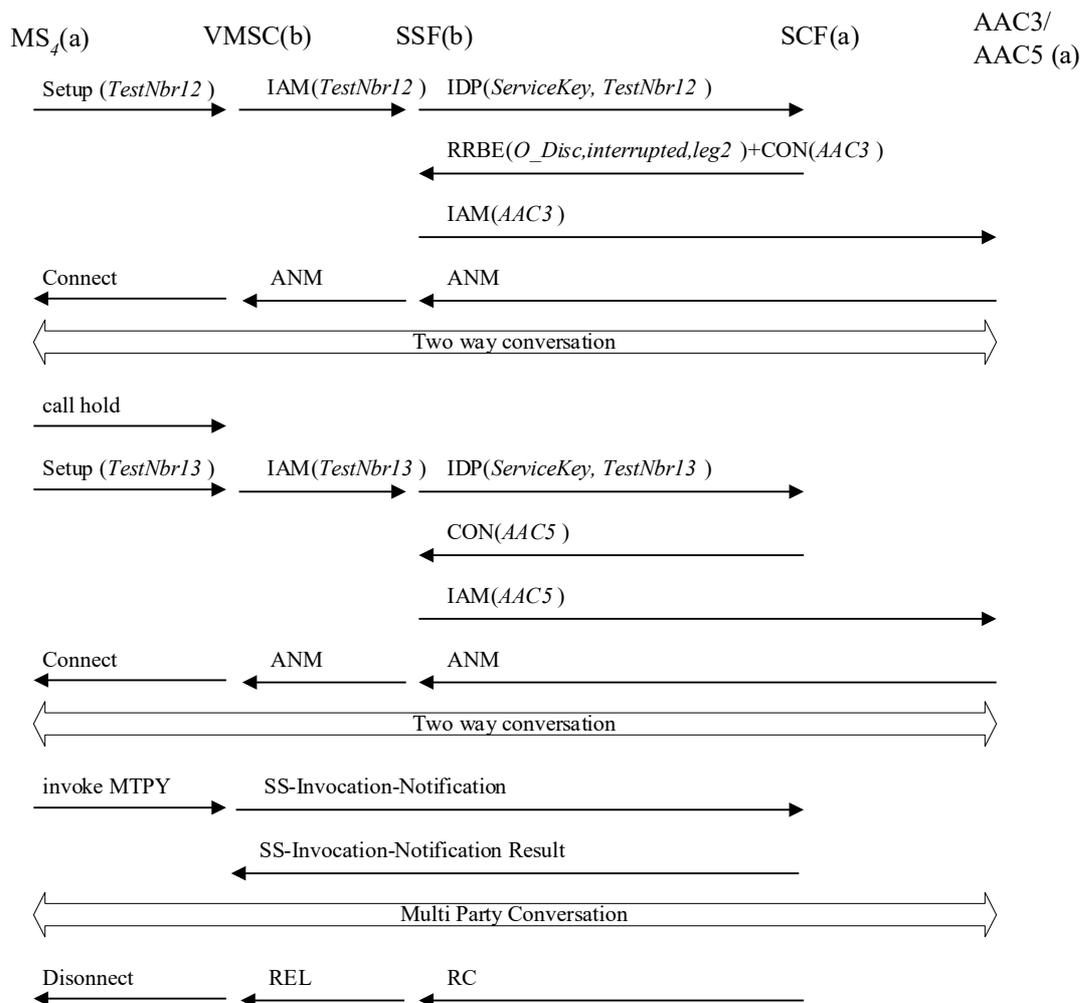
### 2.2.10.1 Check Operation of SS-CSI, MPTY

Overview:

MS<sub>4</sub>(a) registered in VPLMN(b), makes a call to *TestNbr12*. A CAMEL enquiry is made. MS<sub>4</sub>(a) puts this call on hold and initiates an additional call to *TestNbr13*. Another CAMEL enquiry is made. When MS<sub>4</sub>(a) initiates a Multi-Party call, the MSC informs the SCP of this. Service logic at the SCP waits 10 seconds and then releases the calls.

In case a HPLMN does not SS-CSI, this test is not valid. The VPLMN testing personal is assumed to know whether the VPLMN supports the feature and the test execution is sensible.

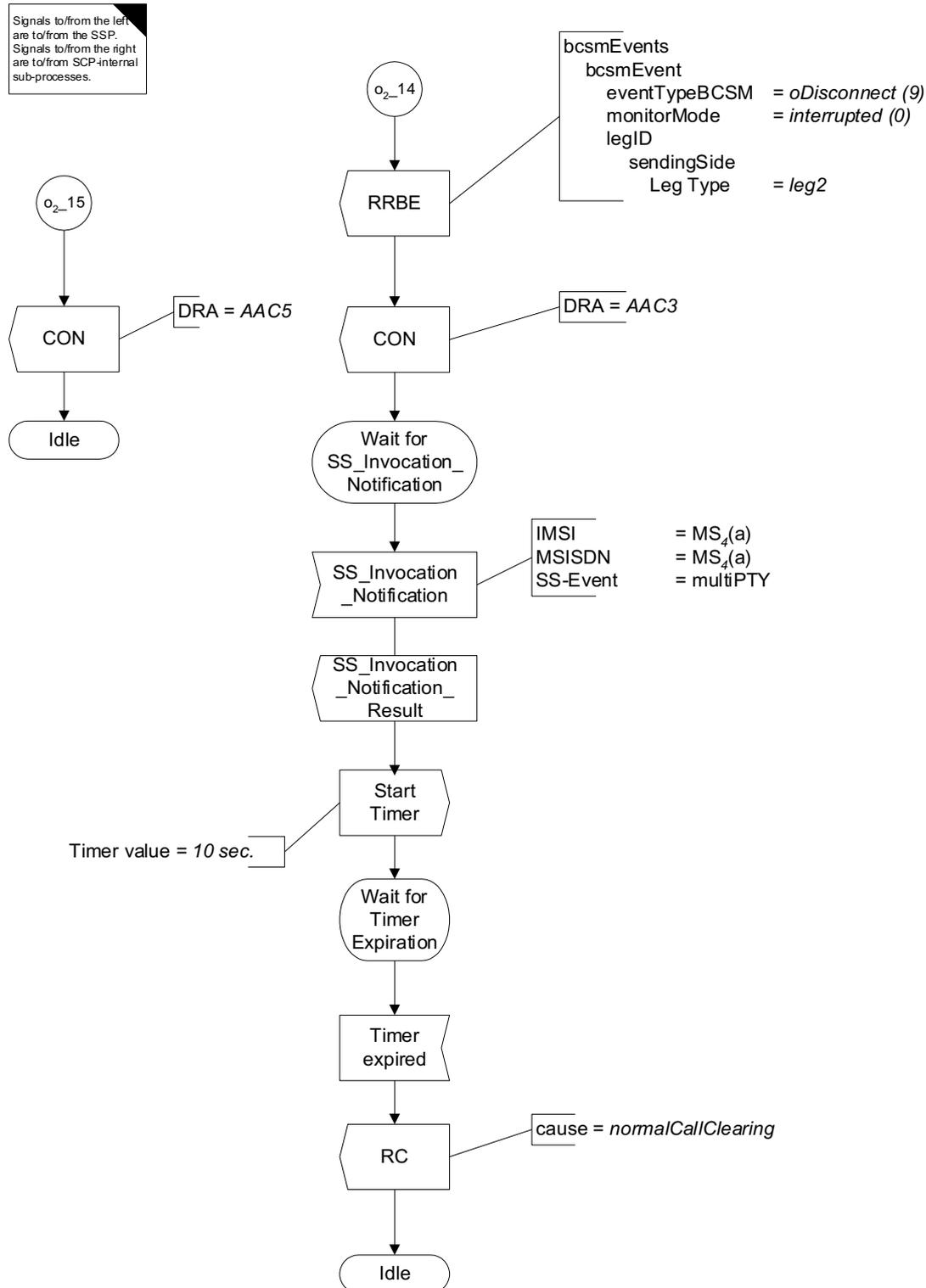
Message-flow:



## Official Document IR.32 End-to-End Functional Capability Specification for Inter-PLMN CAMEL-Roaming

Preconditions:	MS <sub>4</sub> (a) has location updated successfully in VPLMN(b). HLR entry for MS <sub>4</sub> (a) contains "O-CSI" and "SS-CSI". [Set by HLR Admin]
Action:	MS <sub>4</sub> (a) makes a call to <i>TestNbr12</i> and places the call on hold. MS <sub>4</sub> (a) then initiates a call to <i>TestNbr13</i> and invokes a Multi Party call.
Service logic:	IDP calledPartyBCDNumber consists of <i>TestNbr12</i> : The SCF alters the destination address to be that of Test Announcement 3. The SCF monitors for the call being disconnected and then sends Connect.  IDP calledPartyBCDNumber consists of <i>TestNbr13</i> : The SCF alters the destination address to be that of Test Announcement 5 and then sends Connect.  MAP-SS-Invocation-Notification indicates MS <sub>4</sub> (a) has initiated MultiPTY: SCF indicated that MultiPTY is allowed via sending SSNotificationInvocationResult and afterwards waits 10 seconds and then sends a Release Call.
Result:	Successful result if the call is released 10 seconds after the MultiPTY establishment.
Comments:	This test case confirms the correct operation of the visited PLMN when a notification of SS invocation has been registered.

SCP Service Logic

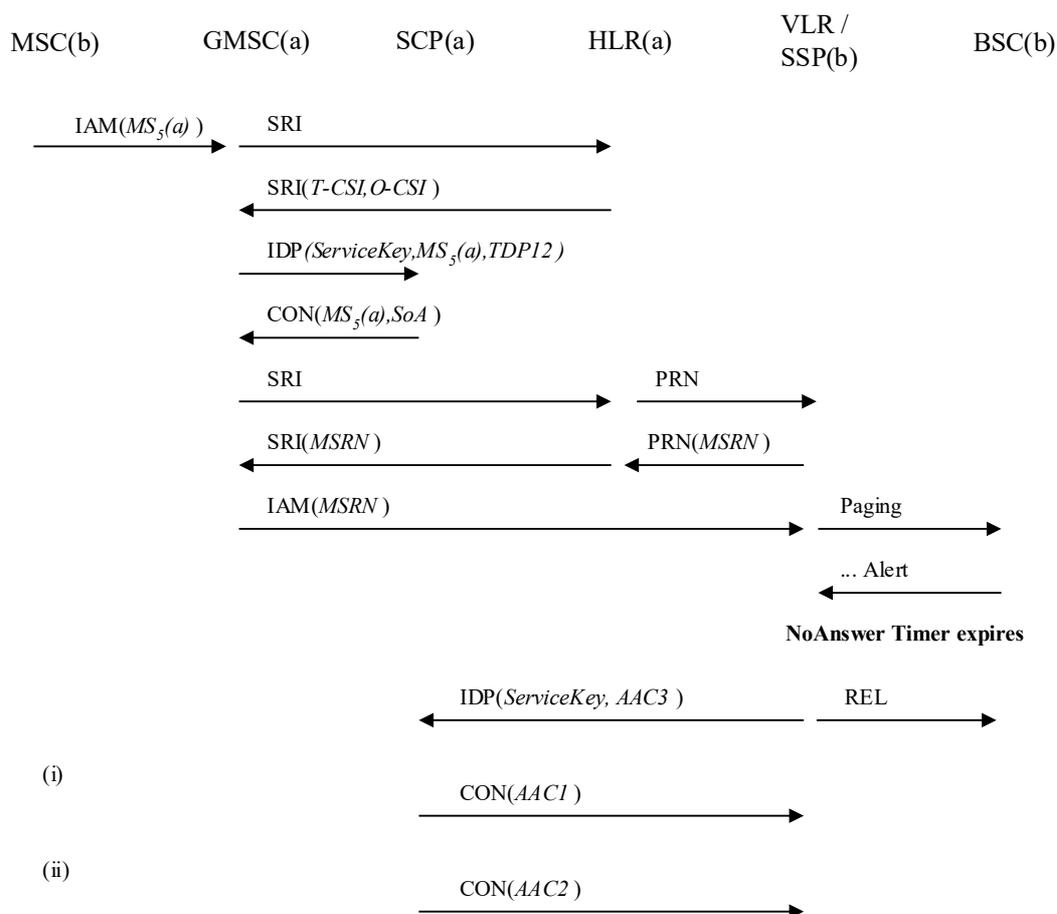


### 2.2.10.2 Call Forwarding on no reply (CFNRy)

Overview:

MS<sub>3</sub>(b) attempts a call to MS<sub>5</sub>(a). MS<sub>5</sub>(a) has activated Call Forwarding on No Reply to Test Announcement 3. MS<sub>5</sub>(a) does not answer the call. GSM call forwarding takes place and because of that the originating camel service is triggered. The triggering of originating camel services in case of late call forwarding is verified. Additionally the contents of InitialDP is checked in the mobile forwarded case.

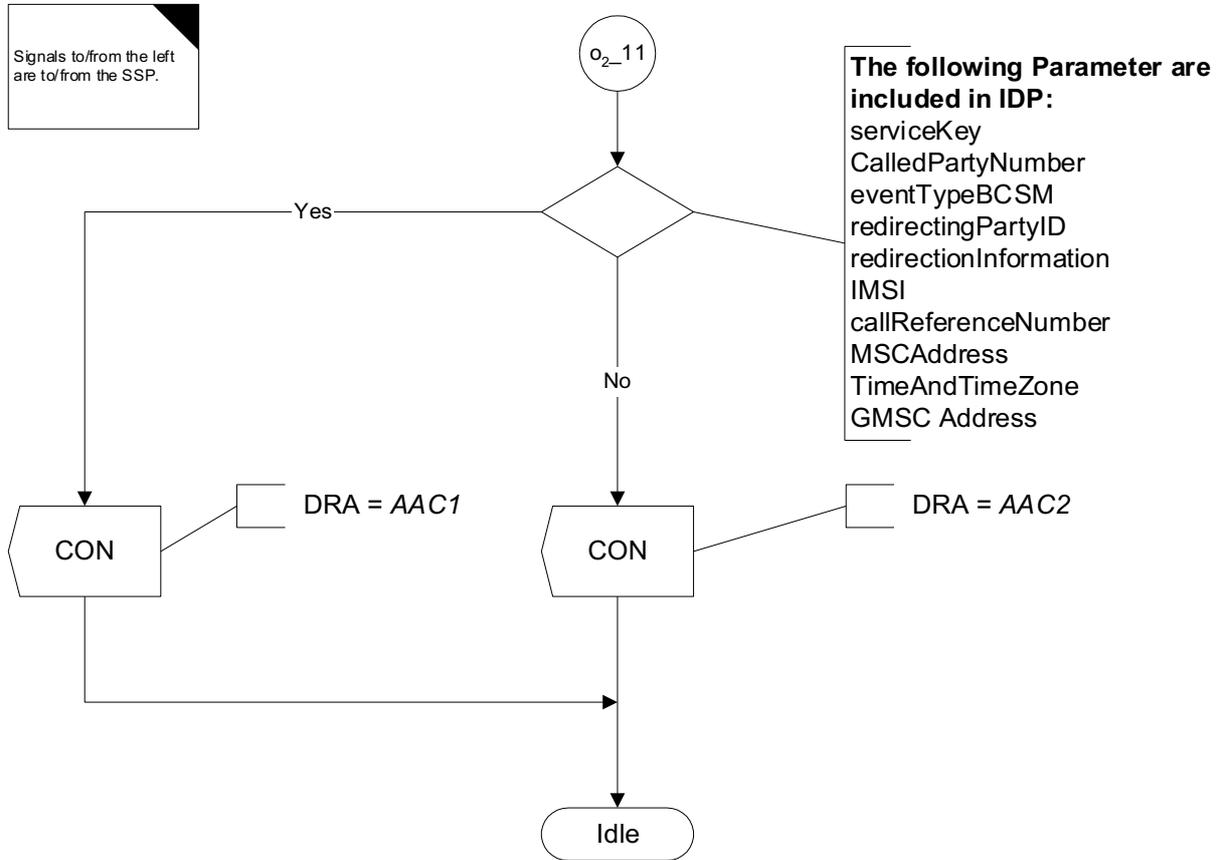
Message-flow:



- Preconditions:**
- MS<sub>5</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b).
  - HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin]
  - MS<sub>5</sub>(a) has activated CFNRy to TestNbr8.
  - Note: If GSM CF to short codes is not supported by HPLMN(a), PLMN(b) has to be informed and the test case should use AAC3 instead of TestNbr8.
- Action:** MS<sub>3</sub>(b) attempts a call to MS<sub>5</sub>(a). MS<sub>5</sub>(a) does **NOT** answer the call and MS<sub>3</sub>(b) waits until NoAnswer timer expires.
- Service logic:** IDP.calledPartyNumber equals AAC3:
- (i) If SCF has received all required parameter within the IDP, the SCF alters destination address to that of Test Announcement 1. SCF sends CON.
  - (ii) If SCF has received all required parameter within the IDP, the SCF alters destination address to that of Test Announcement 2. SCF sends CON.

- (ii) If SCF has **not** received all required parameter within the IDP, the SCF alters destination address to that of Test Announcement 2. SCF sends CON.
- Result: (i) Successful result if Test Announcement 1 is played to calling party.
- (ii) If Test Announcement 2 is played to calling party, at least one parameter of the IDP is missing and the test is failed.
- Comments: This test case confirms that in case of CFNRy an originating CAMEL service is invoked for a subscriber with O-CSI subscription and all required parameters are included in IDP.
- The encountering of TDP12 because of the T-CSI subscription of MS<sub>5(a)</sub> is not in the focus of this testcase.
- Note: In some PLMNs the connection is released because of a timeout on the ISUP interface. In this case none of the Test Announcements is played to the calling subscriber and the test is failed.

SCP Service Logic



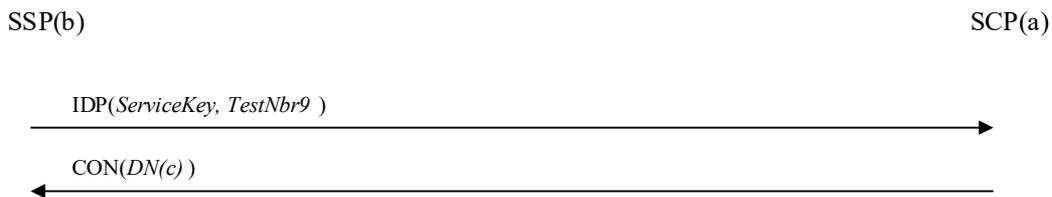
**Figure 40: Call Forwarding on no reply (CFNRy)**

### 2.2.10.3 Barring of outgoing international calls except to HPLMN country (BOICexHC)

Overview:

MS<sub>4</sub>(a) attempts a call to *TestNbr9*. MS<sub>4</sub>(a) has activated Barring of outgoing international calls except those directed to the HPLMN country. SCF alters the destination address to a number located in country(c). It is checked that BOICexHC is executed correctly after mobile originated CAMEL service invocation.

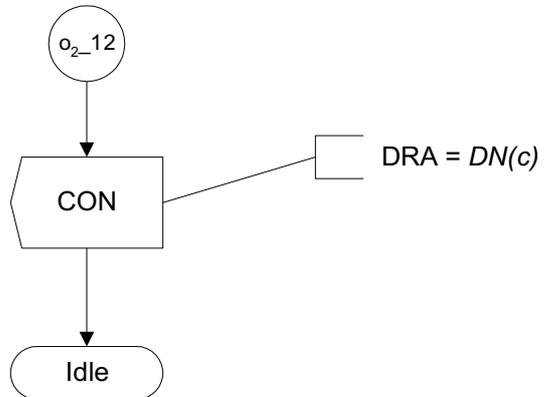
Message-flow:



- Preconditions:** MS<sub>4</sub>(a) has location updated successfully in VPLMN(b).  
 HLR entry for MS<sub>4</sub>(a) contains  
 "O-CSI". [Set by HLR Admin]  
 "SS : BOICexHC : Active". [Set by MS]
- Action:** MS<sub>4</sub>(a) attempts a call to *TestNbr9*.
- Service logic:** IDP.calledPartyBCDNumber consists of *TestNbr9*:  
 The SCF alters the destination address to be that of destination number located in country(c), DN(c).  
 SCF sends CON.
- Result:** Successful result if call attempt fails and no announcement or a VPLMN(b) barring announcement is connected to calling party.
- Comments:** Unsuccessful result if a call attempt to DN(c) occurs.  
 This test case confirms that any originating CAMEL based service does not violate the invocation of BOICexHC supplementary service in case of mobile originated calls.
- Note: For the destination number located in country(c) HPLMN(a) may use an Automatic Answering Circuit or a Test SIM number of a country where actually no CAMEL roaming tests are executed. It is in the responsibility of HPLMN(a) to choose a proper number. A call attempt to DN(c) occurs only if test case fails.

SCP Service Logic

Signals to/from the left are to/from the SSP.



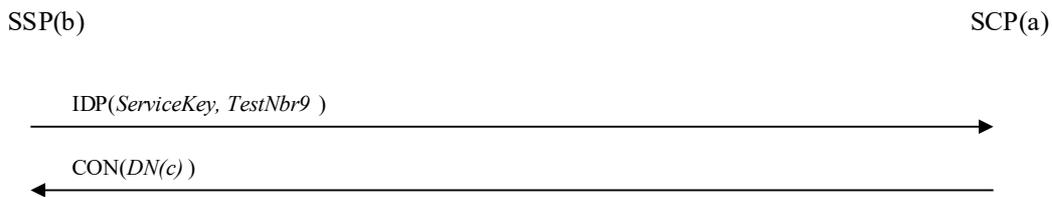
**Figure 41: Barring of outgoing international calls except to HPLMN country (BOICexHC)**

**2.2.10.4 ODB: Barring of outgoing international calls except to HPLMN country (ODB-BOICexHC)**

Overview:

MS<sub>5</sub>(a) attempts a call to *TestNbr9*. Operator Determined Barring - Barring of outgoing international calls except those directed to the HPLMN country applies to MS<sub>5</sub>(a). SCF alters the destination address to a number located in country(c). It is checked that ODB-BOICexHC is executed correctly after mobile originated CAMEL service invocation.

Message-flow:



- Preconditions: MS<sub>5</sub>(a) has location updated successfully in VPLMN(b).  
 HLR entry for MS<sub>5</sub>(a) contains "O-CSI". [Set by HLR Admin]  
 "ODB-BOICexHC : Active". [Set by HLR Admin]
- Action: MS<sub>5</sub>(a) attempts a call to *TestNbr9*.
- Service logic: IDP.calledPartyBCDNumber consists of *TestNbr9*:  
 The SCF alters the destination address to be that of destination number located in country(c), DN(c).  
 SCF sends CON.
- Result: Successful result if call attempt fails and no announcement or a VPLMN(b) barring announcement is connected to calling party.
- Comments: Unsuccessful result if a call attempt to DN(c) occurs.  
 This test case confirms that any originating CAMEL based service does not violate the invocation of ODB-BOICexHC in case of mobile originated calls.

SCP Service Logic

The service behaviour is already described in test case 2.2.10.3

## **2.3 CAMEL Phase 3**

### **2.3.1 MO SMS Control**

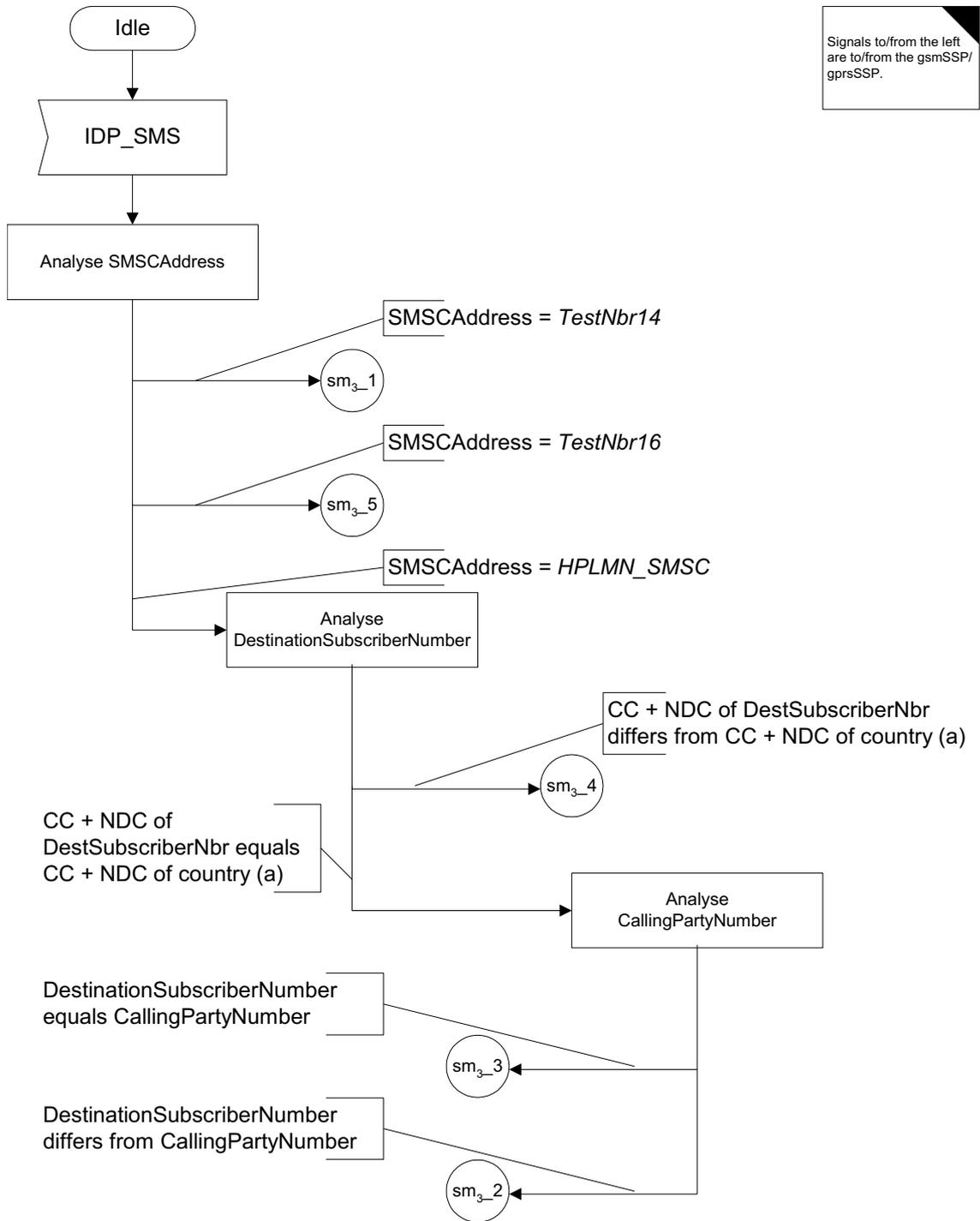
#### General

For some of the test cases in this chapter the successful transmission of a SM is required. It is the responsibility of the HPLMN to configure its SMSC to allow the submission and delivery of SMs from and to the SIMs used for these tests.

The specified tests are valid for a GSM-CS- and a GPRS-environment. To verify that the mentioned CAMEL Phase 3 information flows work in both cases it is necessary to execute the tests for the MSC/VLR switching and SGSN switching, as different elements are involved.

In some of the test cases in this chapter Test Numbers are used for SMSC-addresses. These Test Numbers are short codes which will be translated to valid SMSC-addresses by the service logic.

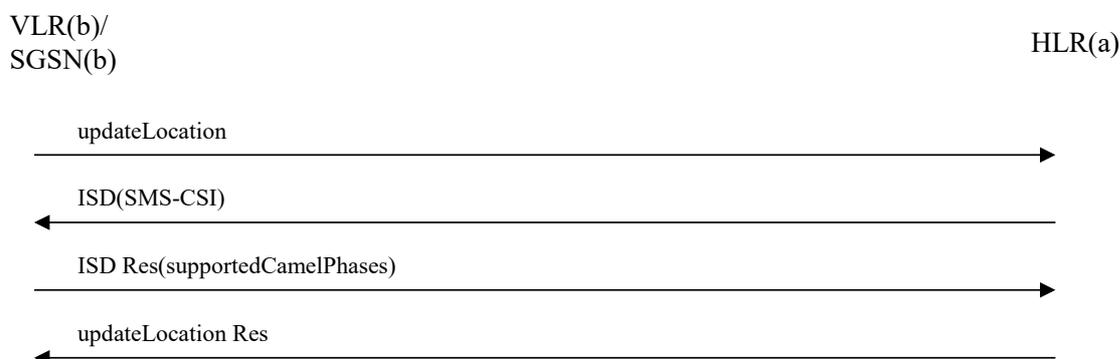
### Entry Service Logic



**Figure 42: MO SMS Control**

## Location Update / GPRS attach

## Message-flow:

**2.3.1.1.1 Location Update by MS<sub>7</sub>(a) in VPLMN(b)**

## Overview:

MS<sub>7</sub>(a) registers in VPLMN(b). The successful insertion of subscriber data – example: SMS-CSI – in the VLR/SGSN is verified.

Preconditions:	MS <sub>7</sub> (a) contains SIM of HPLMN(a). No VLR/SGSN record exists for MS <sub>7</sub> (a). HLR record contains basic and supplementary service information as well as SMS-CSI.
Action:	Power-up MS <sub>7</sub> (a) and perform location registration on VPLMN(b). Check VLR/SGSN record for the IMSI/MSISDN of MS <sub>7</sub> (a).
Service logic:	-
Result:	Successful result if at least the following entries are included in VLR/SGSN record: SMS Teleservice TS22 provisioned SS: BOICexHC : Active for TS20 SMS-CSI TriggerDetectionPoint: <i>SMS_CollectedInfo</i> CamelCapabilityHandling <i>CAMEL phase 3</i> ServiceKey: equal to information provided by HPLMN(a) gsmSCFAddress: equal to information provided by HPLMN(a) default SMS Handling: <i>continue</i>
Comments:	This test case confirms the operation of Insert Subscriber Data procedure including SMS-CSI and that the required subscriber profile for MS <sub>7</sub> (a) is available. If the required subscriber profile is not included in the VLR/SGSN, the error has to be sorted out before continuation of tests.

## SCP Service Logic

The service logic is not involved here.

### 2.3.1.1.2 Location Update by MS<sub>8</sub>(a) in VPLMN(b)

Overview:

MS<sub>8</sub>(a) registers in VPLMN(b). It is verified, that the required subscriber profile for MS<sub>8</sub>(a) – e.g.: SMS-CSI – is available.

Preconditions:	MS <sub>8</sub> (a) contains SIM of HPLMN(a). No VLR/SGSN record exists for MS <sub>8</sub> (a). HLR record contains basic and supplementary service information as well as SMS-CSI.
Action:	Power-up MS <sub>8</sub> (a) and perform location registration on VPLMN(b). Check VLR/SGSN record for the IMSI/MSISDN of MS <sub>8</sub> (a).
Service logic:	-
Result:	Successful result if the following entries are included in VLR/SGSN record: SMS Teleservice TS22 provisioned SMS-CSI TriggerDetectionPoint: <i>SMS_CollectedInfo</i> CamelCapabilityHandling <i>CAMEL phase 3</i> ServiceKey: equal to information provided by HPLMN(a) gsmSCFAddress: equal to information provided by HPLMN(a) defaultSMSHandling: <i>release</i>
Comments:	This test case confirms that the required subscriber profile for MS <sub>8</sub> (a) is available. If the required subscriber profile is not included in the VLR/SGSN, the error has to be sorted out before continuation of tests.

SCP Service Logic

The service logic is not involved here.

### 2.3.1.2 Check operation of IDP\_SMS and CON\_SMS

Overview:

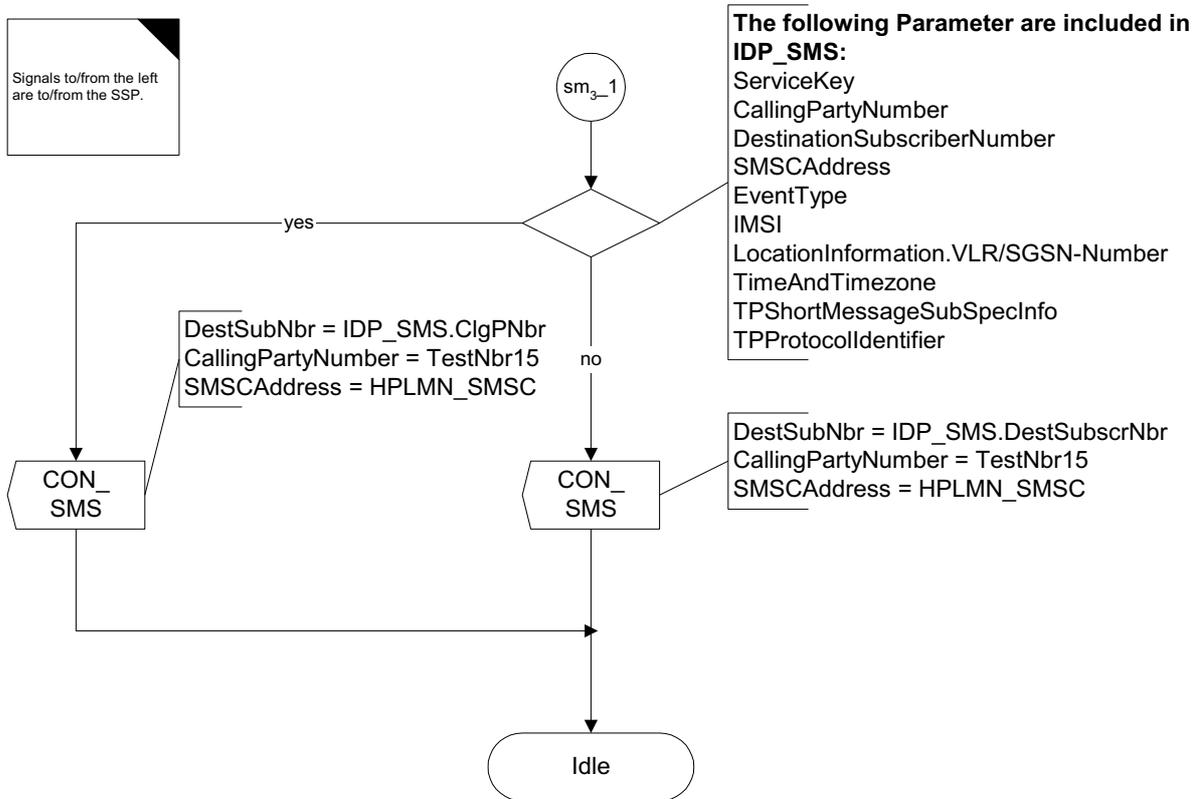
MS<sub>8</sub>(a) sends a SM to MS<sub>7</sub>(a). Depending on InitialDPSMS content, the SM is forwarded to either MS<sub>7</sub>(a) or MS<sub>8</sub>(a), with a modified Calling Party and a modified SMSC-Address. The content of InitialDPSMS is checked and the operation of ConnectSMS is verified.

Message-flow:



Preconditions:	MS <sub>7</sub> (a) and MS <sub>8</sub> (a) have location updated successfully in VPLMN(b). HLR entry for MS <sub>8</sub> (a) contains "SMS-CSI". [Set by HLR Admin] SMSC Address of MS <sub>8</sub> (a) is set to <i>TestNbr14</i> .
Action:	MS <sub>8</sub> (a) sends a SM to MS <sub>7</sub> (a) using <i>TestNbr14</i> as SMSC Address.
Service logic:	IDP_SMS.SMSCAddress equals <i>TestNbr14</i> : (i) If SCF has received all required parameters within IDP_SMS, the SCF alters the DestinationSubscriberNumber to be that of MS <sub>8</sub> (a), the CallingPartyNumber to be <i>TestNbr15</i> and the SMSCAddress to be the one of the HPLMN SMSC. SCF sends ConnectSMS. (ii) If SCF does not receive all parameters within IDP_SMS, the SCF alters the DestinationSubscriberNumber to be that of MS <sub>7</sub> (a), the CallingPartyNumber to be <i>TestNbr15</i> and the SMSCAddress to be the one of the HPLMN SMSC. SCF sends Connect.
Result:	(i) Successful result if MS <sub>8</sub> (a) receives the SM sent previously from MS <sub>8</sub> (a) and CallingPartyNumber equals <i>TestNbr15</i> .  (ii) If no SM is received the test has failed. If MS <sub>7</sub> (a) receives the SM, at least one parameter of the IDP_SMS is missing and the test has failed.
Comments:	This test case confirms the operation of InitialDPSMS and ConnectSMS and ensures that all mandatory parameters are present in InitialDPSMS. If no SM is received a fundamental error has occurred and it has to be sorted out before continuation of tests. <b>Note:</b> The SMSCAddress ( <i>TestNbr14</i> ) sent by MS <sub>8</sub> (a) is a short code that is going to be translated by SCF to a valid SMSCAddress.

SCP Service Logic



**Figure 43: Check operation of IDP\_SMS and CON\_SMS**

**Note:** LocationInformation in SGSN and MSC are mutually exclusive. Location information should always be available - at least the VLR number or SGSN number. Additional parameter may be included in InitialIDPSMS.

### 2.3.1.3 Check operation of REL\_SMS

Overview:

MS<sub>7</sub>(a), registered in VPLMN(b), sends a SM to MS<sub>8</sub>(a), using *HPLMN\_SMSC* as SMSC Address. The SCP should release the SM transmission.

Message-flow:



- Preconditions:** MS<sub>7</sub>(a) and MS<sub>8</sub>(a) have location updated successfully in VPLMN(b).  
HLR entry for MS<sub>7</sub>(a) contains "SMS-CSI". [Set by HLR Admin]  
SMSC Address of MS<sub>7</sub>(a) is set to *HPLMN\_SMSC*.
- Action:** MS<sub>7</sub>(a) sends a SM to MS<sub>8</sub>(a) using *HPLMN\_SMSC* as SMSC Address.
- Service logic:** IDP\_SMS.SMSCAddress consists of *HPLMN\_SMSC* and  
IDP\_SMS.DestSubscriberNumber starts with CC+NDC of country(a)  
and  
IDP\_SMS.DestSubscriberNumber does not equal  
IDP\_SMS.CallingPartyNbr:  
The SCF sends ReleaseSMS.
- Result:** Successful result if the SM is not sent.
- Comments:** If MS<sub>7</sub>(a) receives an indication that SM is successfully transmitted to SMSC and/or MS<sub>8</sub>(a) receives the SM the test has failed  
This test case checks the proper operation of ReleaseSMS.

SCP Service Logic

Signals to/from the left are to/from the SSP.

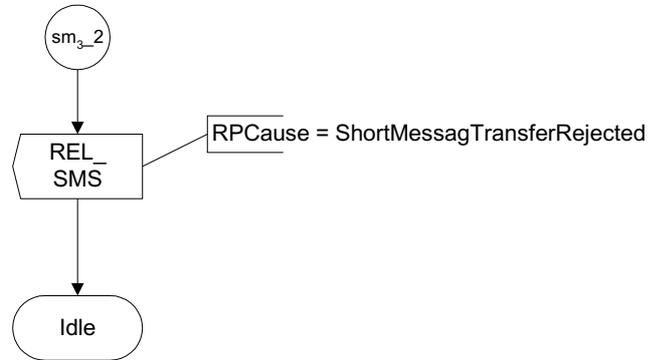


Figure 44: Check operation of REL\_SMS

### 2.3.1.4 Check Default SMS Handling

Message-flow:

gsmSSF(b)/  
gprsSSF(b)

SCF(a)

\_\_\_\_\_ IDP\_SMS(ServiceKey, ClgPartyNbr=MS<sub>x</sub>(a), DestSubscriberNbr=MS<sub>x</sub>(a), SMSC=HPLMN\_SMSC) \_\_\_\_\_>

no answer to IDP

#### 2.3.1.4.1 defaultSMSHandling set to continue

Overview:

MS<sub>7</sub>(a), roaming in VPLMN(b), sends a SM to itself. SCF does not answer to InitialDP SMS. The Default SMS Handling of MS<sub>7</sub>(a) equals *continue*. The SM is forwarded to MS<sub>7</sub>(a). The correct utilisation of the Default SMS Handling is verified.

Preconditions:	MS <sub>7</sub> (a) has location updated successfully in VPLMN(b). HLR record of MS <sub>7</sub> (a) contains SMS-CSI with parameter defaultSMSHandling set to <i>continue</i> . [Set by HLR Admin] SMSC Address of MS <sub>7</sub> (a) is set to <i>HPLMN_SMSC</i> .
Action:	MS <sub>7</sub> (a) sends a SM to itself.
Service logic:	IDP_SMS.SMSCAddress consists of <i>HPLMN_SMSC</i> and IDP_SMS.DestSubscriberNumber starts with CC+NDC of country(a) and IDP_SMS.DestSubscriberNumber equals IDP_SMS.CallingPartyNbr: SCF does not answer to IDP_SMS. Alternatively SCF may send an Abort message.
Result:	Successful result if MS <sub>7</sub> (a) receives the SM previously sent from MS <sub>7</sub> (a).
Comments:	In any other cases the test has failed. This test case checks the correct utilisation of the SMS-CSI parameter defaultSMSHandling= <i>continue</i> . Some SCF implementations do not allow to send no answer to IDP_SMS. In this case SCF should send an Abort message, which triggers the defaultSMSHandling in the SSF.

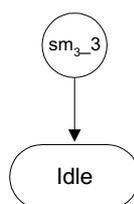
### 2.3.1.4.2 defaultSMShandling set to release

#### Overview:

MS<sub>8</sub>(a), roaming in VPLMN(b), sends a SM to itself. SCP does not answer to InitialDP SMS. The Default SMS Handling of MS<sub>8</sub>(a) equals *release*. The correct utilisation of the Default SMS Handling is verified.

Preconditions:	MS <sub>8</sub> (a) has location updated successfully in VPLMN(b). HLR record of MS <sub>8</sub> (a) contains SMS-CSI with parameter defaultSMShandling set to <i>release</i> . [Set by HLR Admin] SMSC Address of MS <sub>8</sub> (a) is set to <i>HPLMN_SMSC</i>
Action:	MS <sub>8</sub> (a) sends a SM to itself.
Service logic:	IDP_SMS.SMSCAddress consists of <i>HPLMN_SMSC</i> and IDP_SMS.DestSubscriberNumber starts with CC+NDC of country(a) and IDP_SMS.DestSubscriberNumber equals IDP_SMS.CallingPartyNbr: SCF does not answer to IDP_SMS. Alternatively SCF may send an Abort message.
Result:	Successful result if SM is NOT sent.
Comments:	If MS <sub>8</sub> (a) receives an indication that SM is successfully transmitted to SMSC and/or MS <sub>8</sub> (a) receives the SM the test has failed. This test case checks the correct utilisation of the SMS-CSI parameter defaultSMShandling= <i>release</i> . Some SCF implementations do not allow to send no answer to IDP_SMS. In this case SCF should send an Abort message, which triggers the defaultSMShandling in the SSF.

#### SCP Service Logic



**Figure 45: defaultSMShandling set to release**

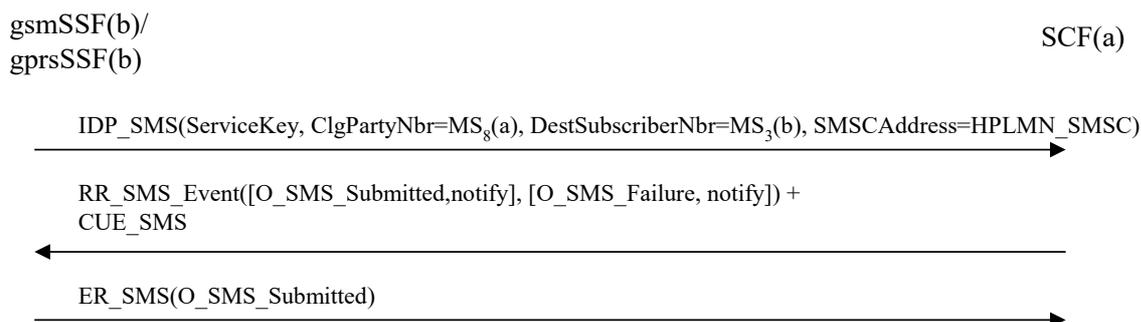
**Note:** In case SCF implementation does not allow to send no answer to IDP\_SMS an Abort message should be sent.

### 2.3.1.5 Check operation of RR\_SMS\_Event, CUE\_SMS and ER\_SMS

#### Overview:

MS<sub>8</sub>(a), registered in VPLMN(b), sends a SM to MS<sub>3</sub>(b), using *HOME\_SMSC* as SMSC Address. The SCF should request the SSF to continue SMS processing without any changes. The operation of ContinueSMS is verified

#### Message-flow:



**Preconditions:**

- \* Test case “2.3.1.4.2 defaultSMSHandling set to release” is passed.
- \* MS<sub>8</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). HLR entry for MS<sub>8</sub>(a) contains "SMS-CSI". [Set by HLR Admin]
- \* SMSC Address of MS<sub>8</sub>(a) is set to *HPLMN\_SMSC*.

**Action:** MS<sub>8</sub>(a) sends a SM to MS<sub>3</sub>(b) using *HPLMN\_SMSC* as SMSC Address.

**Service logic:** IDP\_SMS.SMSCAddress consists of *HPLMN\_SMSC* and IDP\_SMS.DestSubscriberNumber does not start with CC+NDC of country(a):

SCF arms the detection points O\_SMS\_Submitted and O\_SMS\_Failure using the information flow RequestReportSMSEvent and sends ContinueSMS.

**Optional:** After reception of ER\_SMS(O\_SMS\_Submitted) the SCF initiates the transmission of a SM to MS<sub>8</sub>(a) with the following content: “DP O\_SMS\_Submitted reported; the test is passed.”

**Result:** Successful result if

- \* MS<sub>3</sub>(b) received SM sent from MS<sub>8</sub>(a) and
- \* If HPLMN has indicated that SCF-initiated SMS is used: MS<sub>8</sub>(a) received a SM with the following content: “DP O\_SMS\_Submitted reported; the test is passed.”

**Comments:** If no SM is received the test has failed. It is important that test case “2.3.1.4.2 defaultSMSHandling set to release” has passed before to eliminate the possibility that the actual test case passed because of the following two errors:

1. ContinueSMS leads to DefaultCallHandling in SSF and
2. DefaultCallHandling = release does not work

The correct reporting of the detection point O\_SMS\_Submitted to the SCF can be checked in the following ways:

1. If HPLMN has indicated that SCF-initiated SMS is used: MS<sub>8</sub>(a) will receive an appropriate SM.
2. The tester uses a protocol analyser and checks the transmission of EventReportSMS(O\_SMS\_Submitted).

SCP Service Logic

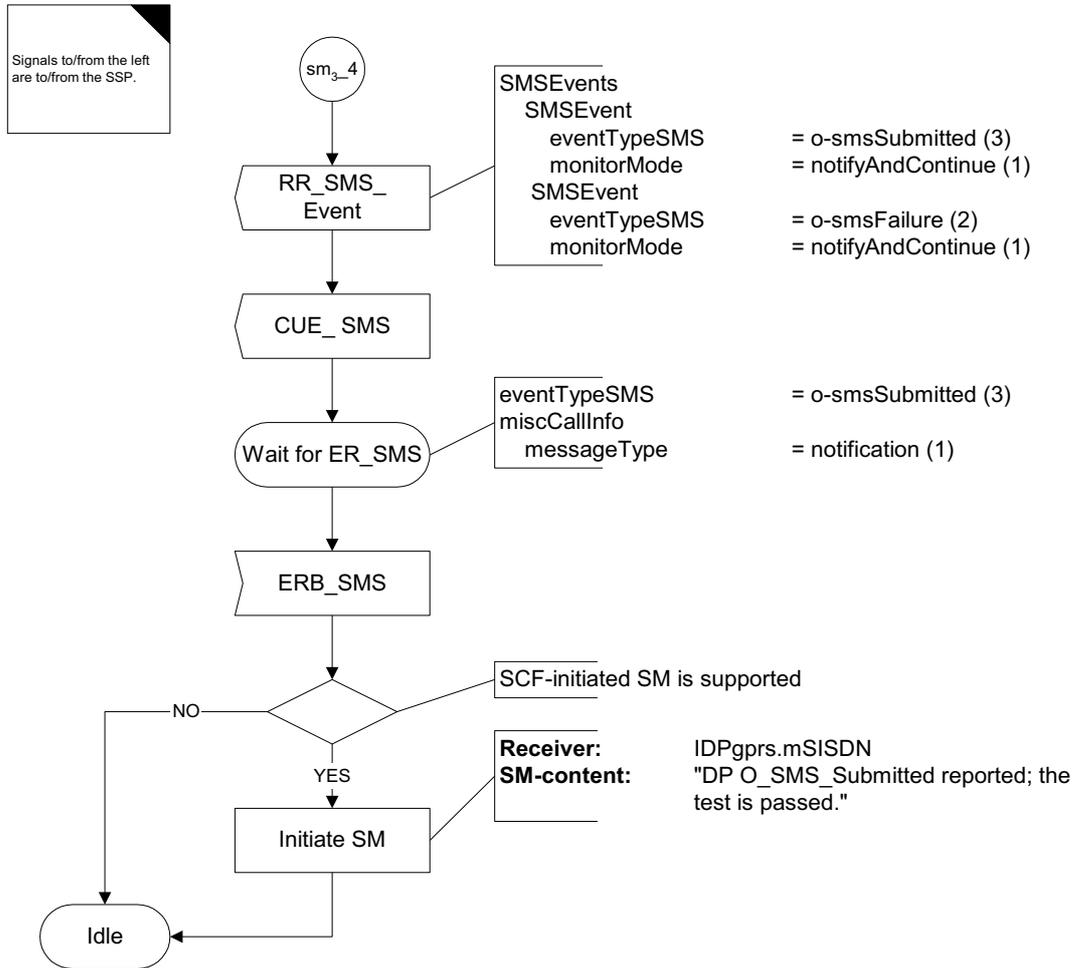


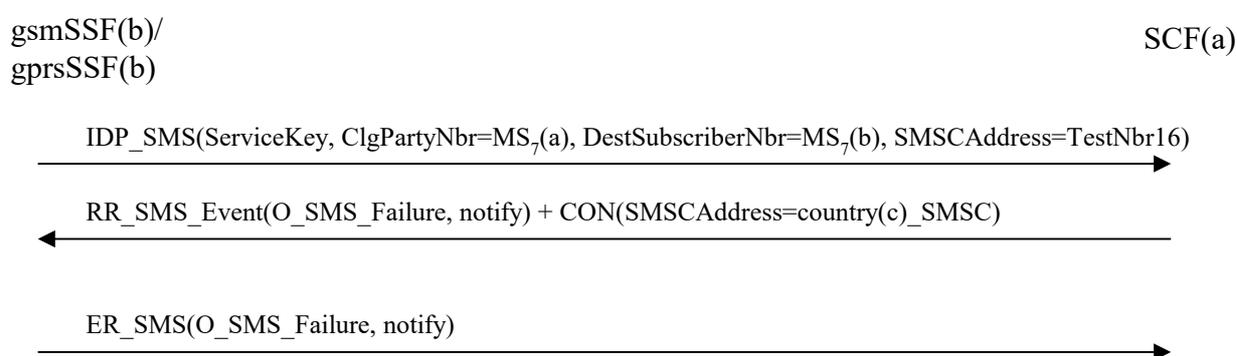
Figure 46: Check operation of RR\_SMS\_Event, CUE\_SMS and ER\_SMS

### 2.3.1.6 Barring of outgoing international calls except to HPLMN country for SMS (BOICexHC) (optional)

#### Overview:

MS<sub>7</sub>(a) sends a SM to *TestNbr16*. The Supplementary Service “Barring of outgoing international calls except those directed to the HPLMN country” applies to MS<sub>7</sub>(a) for SMS (Teleservice 20). SCF alters the SMSC address to a SMSC located in country(c). It is checked that BOICexHC is executed correctly after mobile originated CAMEL service invocation. This test depends on the possibility to use a SMSC not belonging to the VPLMN nor HPLMN, but which will correctly deliver the messages it receives.

#### Message-flow:



**Preconditions:** MS<sub>7</sub>(a) has location updated successfully in VPLMN(b).  
HLR entry for MS<sub>7</sub>(a) contains:  
“SMS-CSI”. [Set by HLR Admin]  
“SS: BOICexHC : Active for TS20”. [Set by HLR Admin]  
SMSC Address of MS<sub>7</sub>(a) is set to *TestNbr16*

**Action:** MS<sub>7</sub>(a) sends a SM to itself using *TestNbr16* as SMSC Address.

**Service logic:** IDP\_SMS.SMSCAddress consists of *TestNbr16*:  
The SCF alters the SMSC Address to be a SMSC in country(c).  
SCF arms the detection point O\_SMS\_Failure using the information flow RequestReportSMSEvent and sends ConnectSMS.

**Optional:** After reception of ER\_SMS(O\_SMS\_Failure) the SCF initiates the transmission of a SM to MS<sub>7</sub>(a) with the following content:  
“DP O\_SMS\_Failure reported; the test is passed.”

**Result:** Successful result  
\* if the SM transmission is barred and  
\* If HPLMN has indicated that SCF-initiated SMS is used: MS<sub>7</sub>(a) received a SM with the following content: “DP O\_SMS\_Failure reported; the test is passed.”

**Comments:** If MS<sub>7</sub>(a) receives an indication that SM is successfully transmitted to SMSC and/or MS<sub>7</sub>(a) receives the SM the test has failed.  
This test case confirms that any originating CAMEL based service does not violate the invocation of BOICexHC supplementary service in case of mobile originated SM.

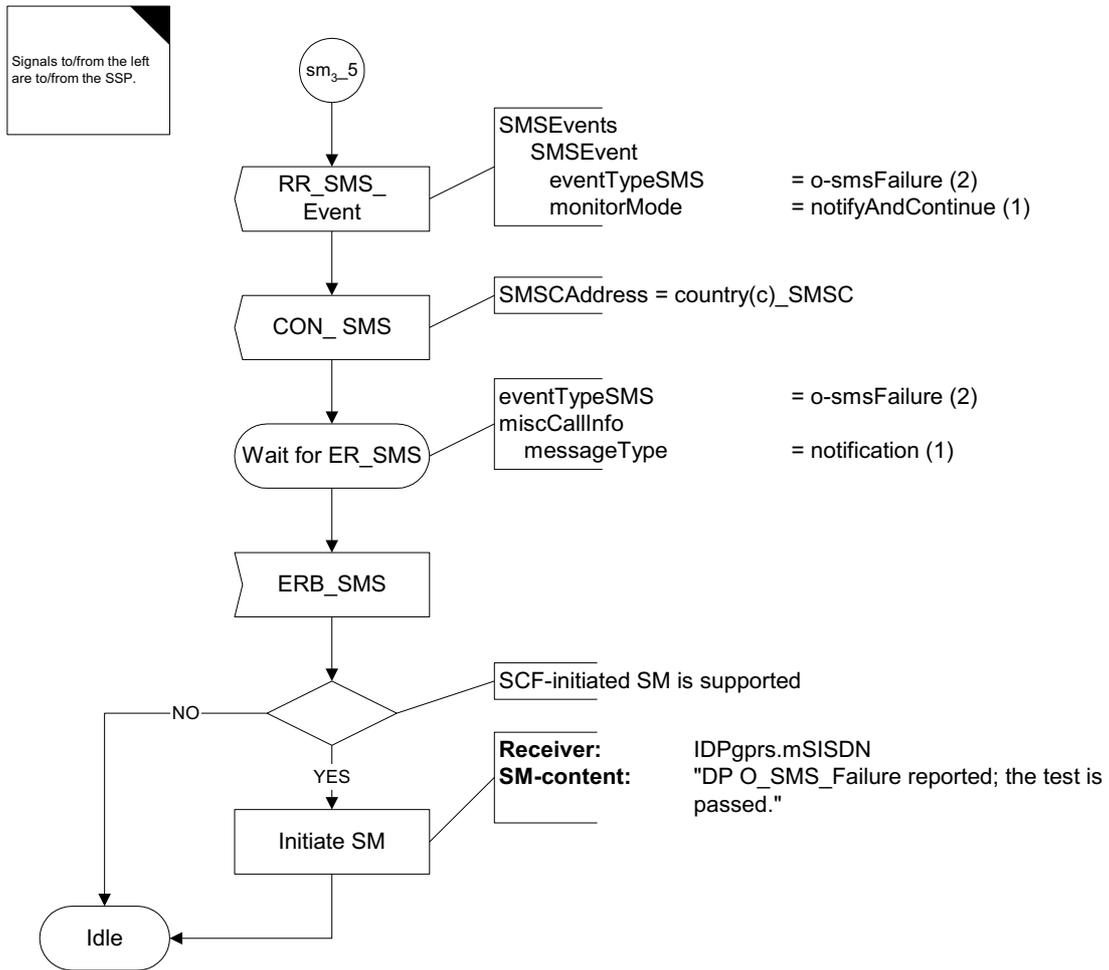
**Note1:** For this test to be performed, a SMSC located in a country different from the HPLMN and VPLMN must be used. Furthermore, MS<sub>7</sub>(a) must be in a range of number accepted both as origin and

destination by the SMSC if submitted. This is to make sure that in case barring does not work the SMS is delivered. If such a SMSC is not available a protocol analyser can be used to verify that the SMS is properly barred at the VMSC.

**Note2:** The necessity to send ER\_SMS(O\_SMS\_Failure) in case SMS is barred because of ODB is part of a CR to 3GPP TS 23.078. This CR is not included in TS 23.078 referred to in this document. If the mentioned CR is not implemented in visited-gsmSSF/gprsSSF ER\_SMS(O\_SMS\_Failure) may not be sent.

**Note3:** The SMSCAddress (TestNbr16) sent by MS<sub>7</sub>(a) is a short code that is going to be translated by SCF to a valid SMSC-address.

SCP Service Logic



**Figure 47: Barring of outgoing international calls except to HPLMN country for SMS (BOICexHC)**

### 2.3.2 GPRS Control

#### General

Most of the tests included in this chapter require to establish a PDP context to an application located in HPLMN(a). HPLMN(a) should give VPLMN(b) information on how to access the server/application to download data.

There is no requirement for the application to download a certain amount of data. In most of the tests the SCF will release the PDP context as soon as a certain amount of data is transmitted. To achieve this the application has to provide the possibility to transfer 50kByte or more. It should easily be able for the tester to download such an amount of data.

In addition HPLMN(a) should take care to choose an application which does not require very specific tools to be accessed because these tools have to be used by the tester during testing. It is recommended to use an Internet access or FTP.

The message flow may marginally differ from the one included in the test cases. This particularly applies to the TCAP handling.

Entry Service Logic

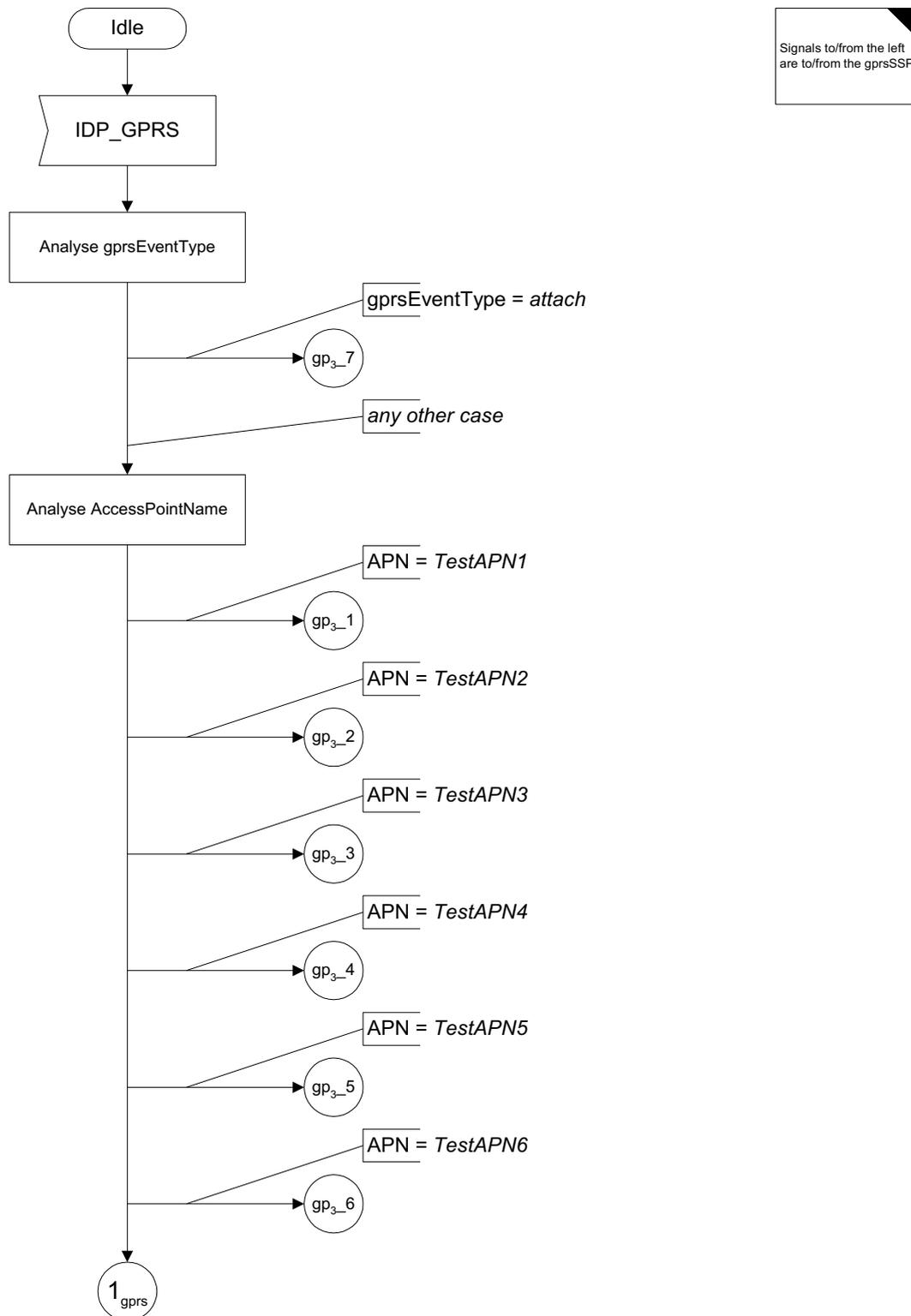


Figure 48: Entry process for GPRS service logic: CAMEL Phase 3 (part 1 of 2)

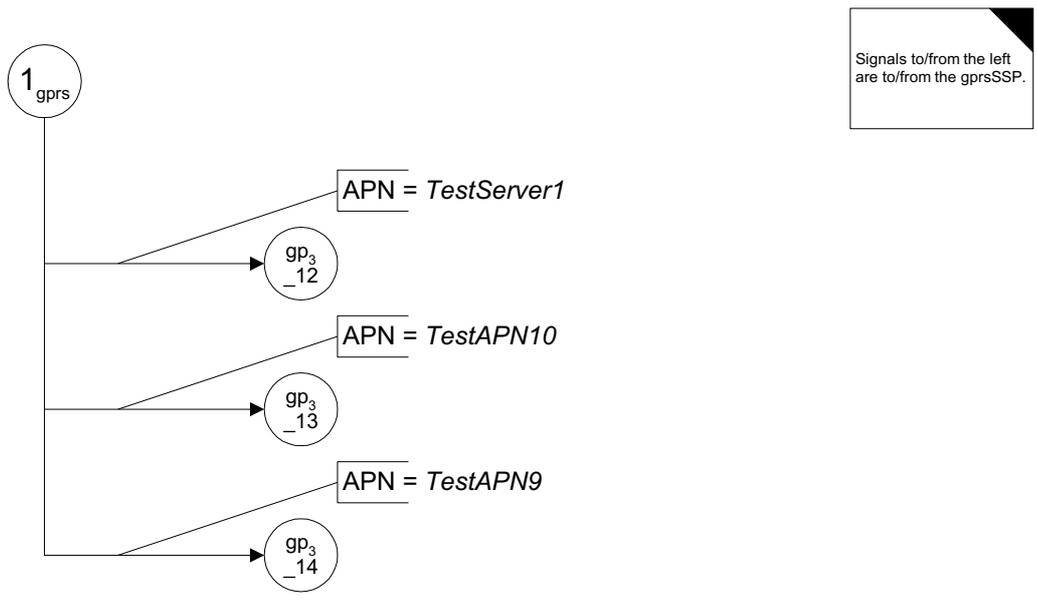
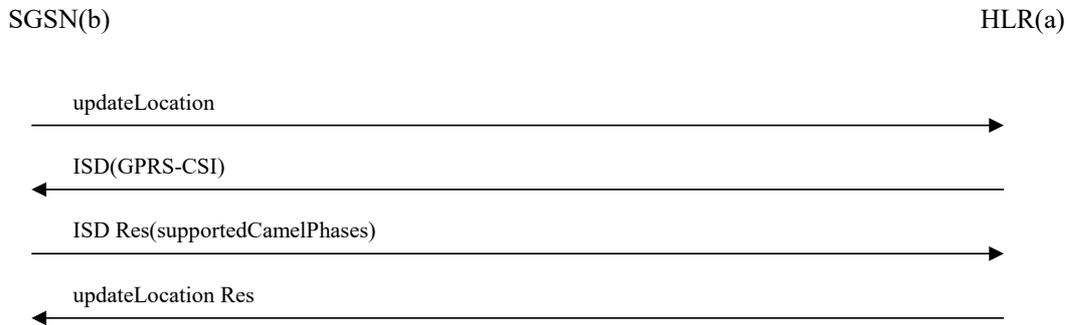


Figure 49: Entry process for GPRS service logic: CAMEL Phase 3 (part 2 of 2)

### 2.3.2.1 GPRS-Attach

Message-flow:



#### 2.3.2.1.1 GPRS-Attach by MS<sub>7</sub>(a) in VPLMN(b) (GPRS Attach only)

Overview:

MS<sub>7</sub>(a) performs a GPRS-Attach in VPLMN(b). The successful insertion of subscriber data – e.g.: GPRS-CSI – in the SGSN is verified.

Preconditions:	MS <sub>7</sub> (a) contains SIM of HPLMN(a). No SGSN record exists for MS <sub>7</sub> (a). HLR record contains basic service information including GPRS subscription data as well as GPRS-CSI.
Action:	Power-up MS <sub>7</sub> (a) and perform GPRS-Attach only on VPLMN(b). Check MM contexts in MS <sub>7</sub> (a) and SGSN(b) for the IMSI/P-TMSI /MSISDN of MS <sub>7</sub> (a).
Service logic:	-
Result:	Successful result If MS <sub>7</sub> (a) is in READY state, If valid MM contexts are established in MS <sub>7</sub> (a) and SGSN(b) and If at least the following entries are included in SGSN record: * GPRS-CSI gprs-CamelTDPDataList GPRS-CamelTDPData gprs-TriggerDetectionPoint      pdp-ContextEstablishment (11) serviceKey                      equal to info provided by HPLMN(a) gsmSCF-Address                  equal to info provided by HPLMN(a) defaultSessionHandling      releaseTransaction (1) GPRS-CamelTDPData gprs-TriggerDetectionPoint      pdp-ContextChangeOfPosition (14) serviceKey                      equal to info provided by HPLMN(a) gsmSCF-Address                  equal to info provided by HPLMN(a) defaultSessionHandling      continueTransaction (0) camelCapabilityHandling      CAMEL Phase 3 (3)

Comments: This test case confirms operation of Insert Subscriber Data procedure including GPRS-CSI and that the required subscriber profile for MS<sub>7</sub>(a) is available. If the required subscriber profile is not included in the SGSN, the error has to be sorted out before continuation of tests.

SCF Service Logic

The service logic is not involved here.

### 2.3.2.1.2 GPRS-Attach by MS<sub>8</sub>(a) in VPLMN(b) (GPRS Attach only)

Overview:

MS<sub>8</sub>(a) performs a GPRS-Attach in VPLMN(b). The successful insertion of subscriber data – example: GPRS-CSI – in the SGSN is verified.

Preconditions:	MS <sub>8</sub> (a) contains SIM of HPLMN(a). No SGSN record exists for MS <sub>8</sub> (a). HLR record contains basic service information including GPRS subscription data as well as GPRS-CSI.
Action:	Power-up MS <sub>8</sub> (a) and perform GPRS-Attach only on VPLMN(b). Check MM contexts in MS <sub>8</sub> (a) and SGSN(b) for the IMSI/P-TMSI /MSISDN of MS <sub>8</sub> (a).
Service logic:	-
Result:	Successful result If MS <sub>8</sub> (a) is in READY state, If valid MM contexts are established in MS <sub>8</sub> (a) and SGSN(b) and If at least the following entries are included in SGSN record: * GPRS-CSI gprs-CamelTDPDataList GPRS-CamelTDPData gprs-TriggerDetectionPoint      attach (1) serviceKey                      equal to info provided by HPLMN(a) gsmSCF-Address                 equal to info provided by HPLMN(a) defaultSessionHandling        continueTransaction (0) GPRS-CamelTDPData gprs-TriggerDetectionPoint      attachChangeOfPosition (2) serviceKey                      equal to info provided by HPLMN(a) gsmSCF-Address                 equal to info provided by HPLMN(a) defaultSessionHandling        releaseTransaction (1) camelCapabilityHandling        CAMEL Phase 3 (3)
Comments:	This test case confirms operation of Insert Subscriber Data procedure including GPRS-CSI and that the required subscriber profile for MS <sub>8</sub> (a) is available. If the required subscriber profile is not included in the SGSN, the error has to be sorted out before continuation of tests.

SCF Service Logic

The service logic is not involved here.

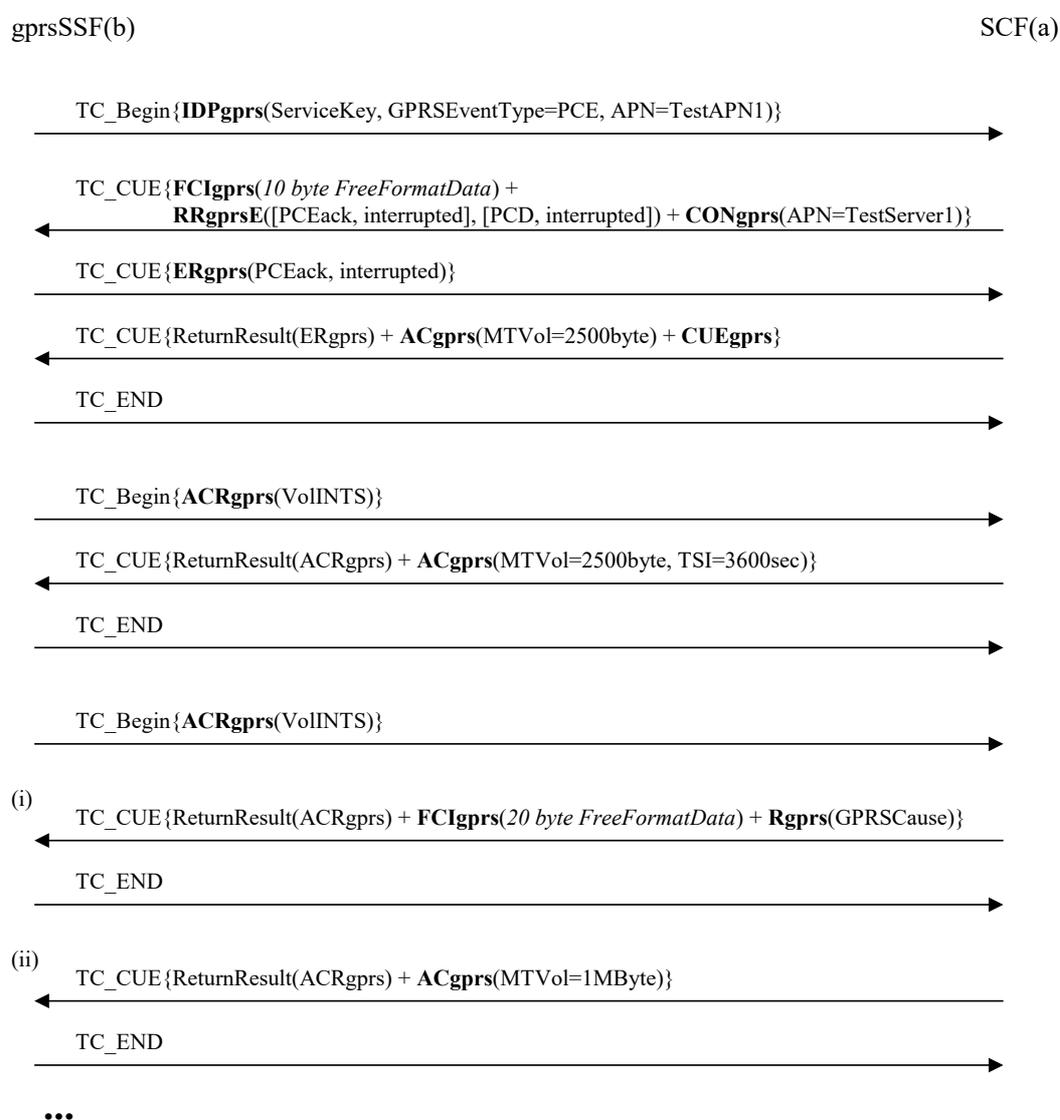
### 2.3.2.2 Check correct reporting of used Time and Volume using ACgprs/ACRgprs

#### 2.3.2.2.1 Check used Volume, 2 PDP context periods, tariffSwitch after PCD

Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), sets up a PDP context to *TestAPN1* and is connected to *TestServer1*. MS<sub>7</sub>(a) transfers data. If the transferred volume in the PDP context periods is reported correctly and all mandatory parameter are included in InitialDPGPRS SCF releases the PDP context after transmission of 5 Kbytes. Otherwise PDP context is continued. The operation of the CAP3-information flows FurnishChargingInformationGPRS, RequestReportGPRSEvent, ConnectGPRS, EventReportGPRS, ApplyChargingGPRS, ApplyChargingReportGPRS, ContinueGPRS and ReleaseGPRS is verified.

Message-flow:



## Official Document IR.32 End-to-End Functional Capability Specification for Inter-PLMN CAMEL-Roaming

Preconditions:	<p>MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)</p> <p>No valid PDP contexts are established in MS<sub>7</sub>(a).</p> <p>MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).</p>
Action:	<p>MS<sub>7</sub>(a) performs "Activate PDP Context Request" to <i>TestAPN1</i></p> <p>MS<sub>7</sub>(a) transmits data using a service provided by HPLMN(a).</p>
Service logic:	<p>IDPgprs.accessPointName consists of <i>TestAPN1</i>:</p> <p>The SCF alters the APN to be that of Test Server 1 and sends FClgprs(10 byte FFD) + RRgprsE + CONgprs.</p> <p>When ERgprs(PCE-ack) is received SCF sends ACgprs(MTVol=2500byte) + CUEgprs.</p> <p>When ACRgprs(VolINTS1) is received SCF sends ACgprs(MTVol=2500byte,TSI=3600sec)</p> <p>When ACRgprs(VolINTS2) is received SCF sends</p> <p>(i) FClgprs(20 byte FFD) + Rgprs if  VolINTS1 = 2500 ± 250 byte AND  VolINTS2 = 5000 ± 500 byte AND  all mandatory parameters are included in IDPgprs</p> <p>(ii) ACgprs(MTVol=1.000.000byte) if  transferred volume values are not received correctly OR  mandatory parameter are missing in IDPgprs</p>
Result:	<p>(i) Successful result if data transfer is released after 5000 ± 500 byte.</p>
Comments:	<p>(ii) In any other case the test has failed.</p> <p>This test case confirms the correct reporting of transferred volume of two periods within a PDP context.</p> <p>The proper inter-working of FClgprs can be verified through post-processing of TAP records in the HPLMN. The FreeFormatData sent in the second FClgprs should overwrite the FreeFormatData of first FClgprs. FreeFormatData are mapped to the parameter cseInformation in the TAP record.</p>

SCF Service Logic

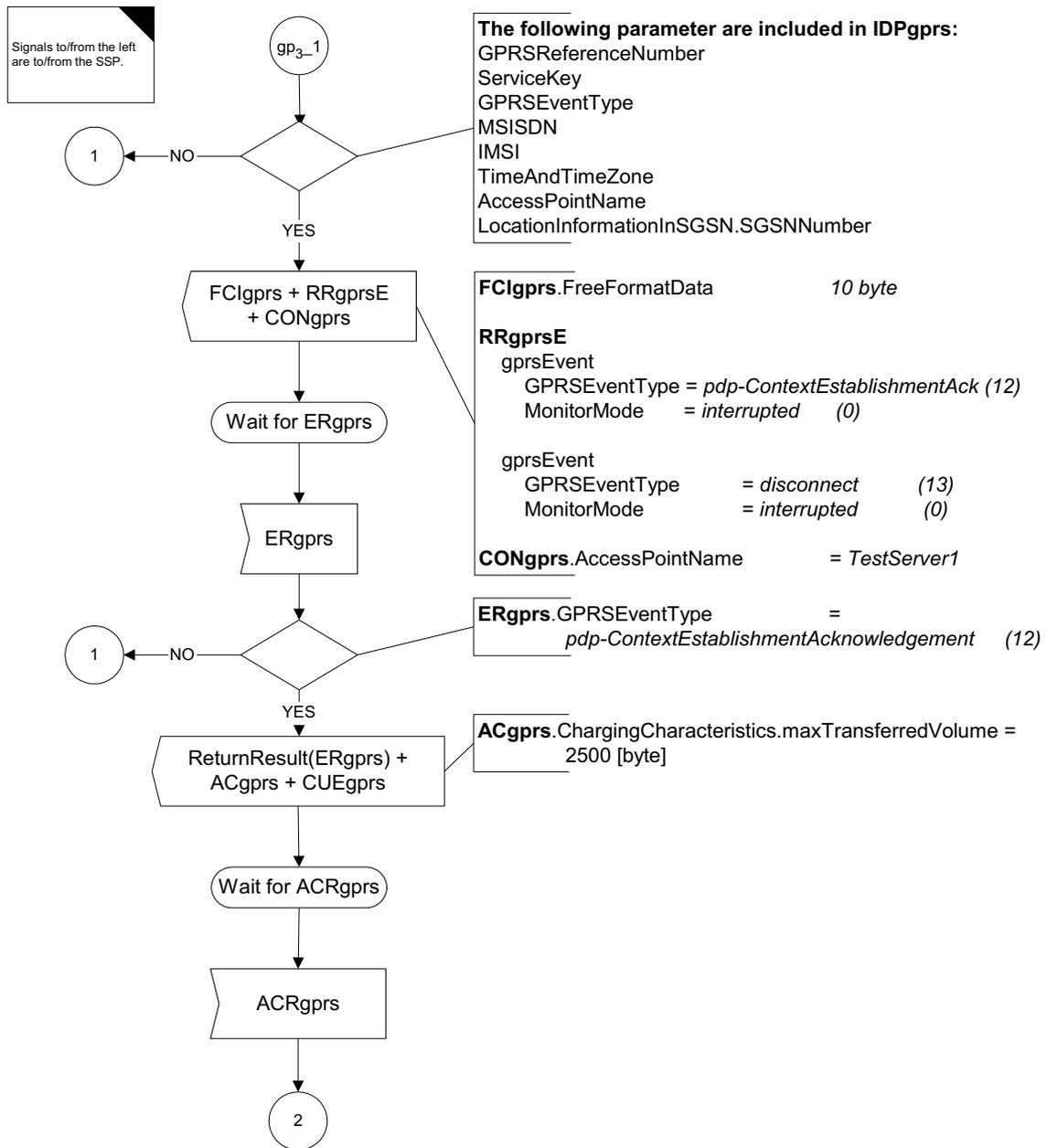
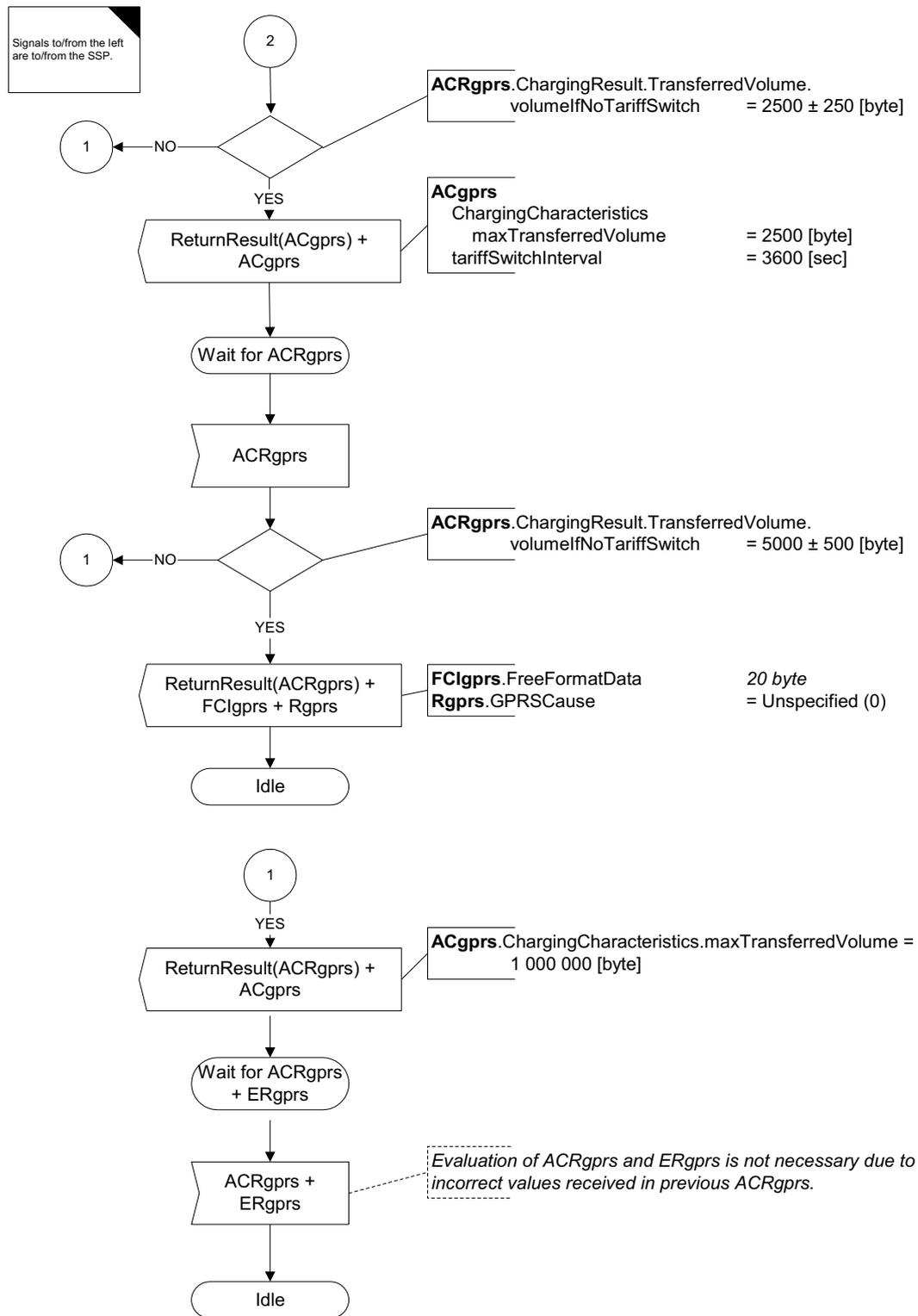


Figure 50: Check used Volume, 2 PDP context periods, tariffSwitch after PCD



**Figure 51: Check used Volume, 2 PDP context periods, tariffSwitch after PCD (2)**

**Notes:**

\* Additional parameter may be included in IDPgprs. This still leads to exit “yes”.

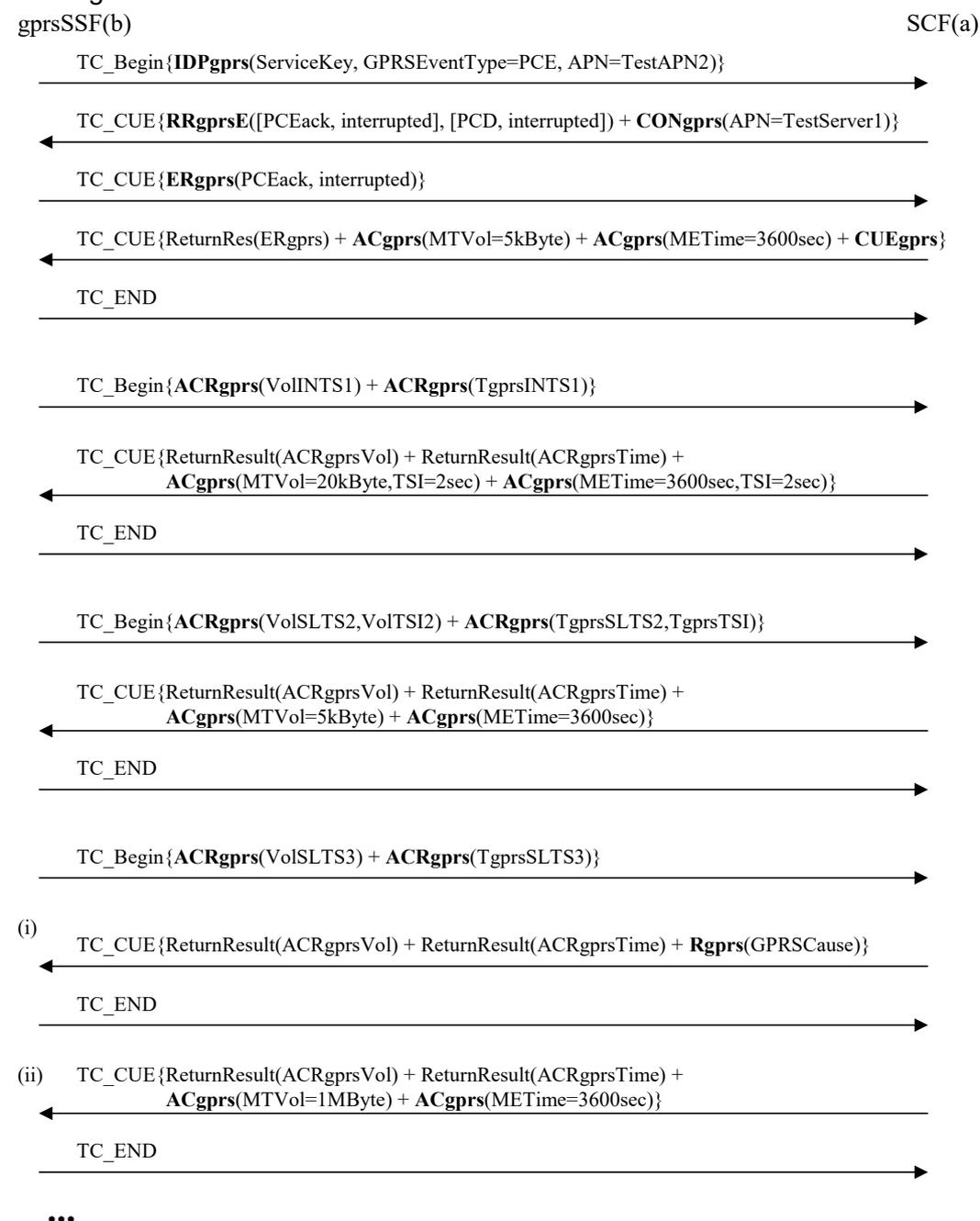
\* The 10 byte FreeFormatData of the first FCIgprs information flow should differ from the first 10 byte of the second FCIgprs to make clear that the FreeFormatData of first FCIgprs got overwritten.

### 2.3.2.2.2 Check used Volume, 3 PDP context periods, tariffSwitch in 2<sup>nd</sup> period

Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), sets up a PDP context to *TestAPN2* and is connected to *TestServer1*. MS<sub>7</sub>(a) transfers data. A tariff switch occurs in the second PDP context period. If the transferred volume in the PDP context periods is reported correctly SCF releases the PDP context after transmission of 30 Kbytes. Otherwise PDP context is continued.

Message-flow:



Preconditions:	<p>MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)</p> <p>No valid PDP contexts are established in MS<sub>7</sub>(a).</p> <p>MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).</p>
Action:	<p>MS<sub>7</sub>(a) performs "Activate PDP Context Request" to <i>TestAPN2</i></p> <p>MS<sub>7</sub>(a) transmits data using a service provided by HPLMN(a).</p>
Service logic:	<p>IDPgprs.accessPointName consists of <i>TestAPN2</i>:</p> <p>The SCF alters the APN to be that of Test Server 1 and sends RRgprsE + CONgprs.</p> <p>When ERgprs(PCE-ack) is received SCF sends ACgprs(MTVol=5000byte) + ACgprs(METime=3600sec) + CUEgprs.</p> <p>When ACRgprs(VolINTS1) + ACRgprs(TgprsINTS1) is received SCF sends ACgprs(MTVol=20.000byte,TSI=2sec) + ACgprs(METime=3600sec,TSI=2sec)</p> <p>When ACRgprs(VolSLTS2,VolTSI2) + ACRgprs(TgprsSLTS2,TgprsTSI2) is received SCF sends ACgprs(MTVol=5.000byte) + ACgprs(METime=3600sec)</p> <p>When ACRgprs(VolSLTS3) + ACRgprs(TgprsSLTS3) is received SCF sends</p> <p>(i) Rgprs if [VolINTS1 = 5000 ± 500 byte] AND [VolSLTS2 + VolTSI2 = 25.000 ± 2.500 byte] AND [VolTSI2 + VolSLTS3 = 30.000 ± 3.000 byte]</p> <p>(ii) ACgprs(MTVol=1.000.000 byte) if transferred volume values are not received correctly.</p>
Result:	<p>(i) Successful result if data transfer is released after 30.000 ± 300 byte.</p>
Comments:	<p>(ii) In any other case the test has failed.</p> <p>This test case confirms the correct reporting of transferred volume of three periods within a PDP context. A tariff switch occurs in the second PDP context period.</p>

SCF Service Logic

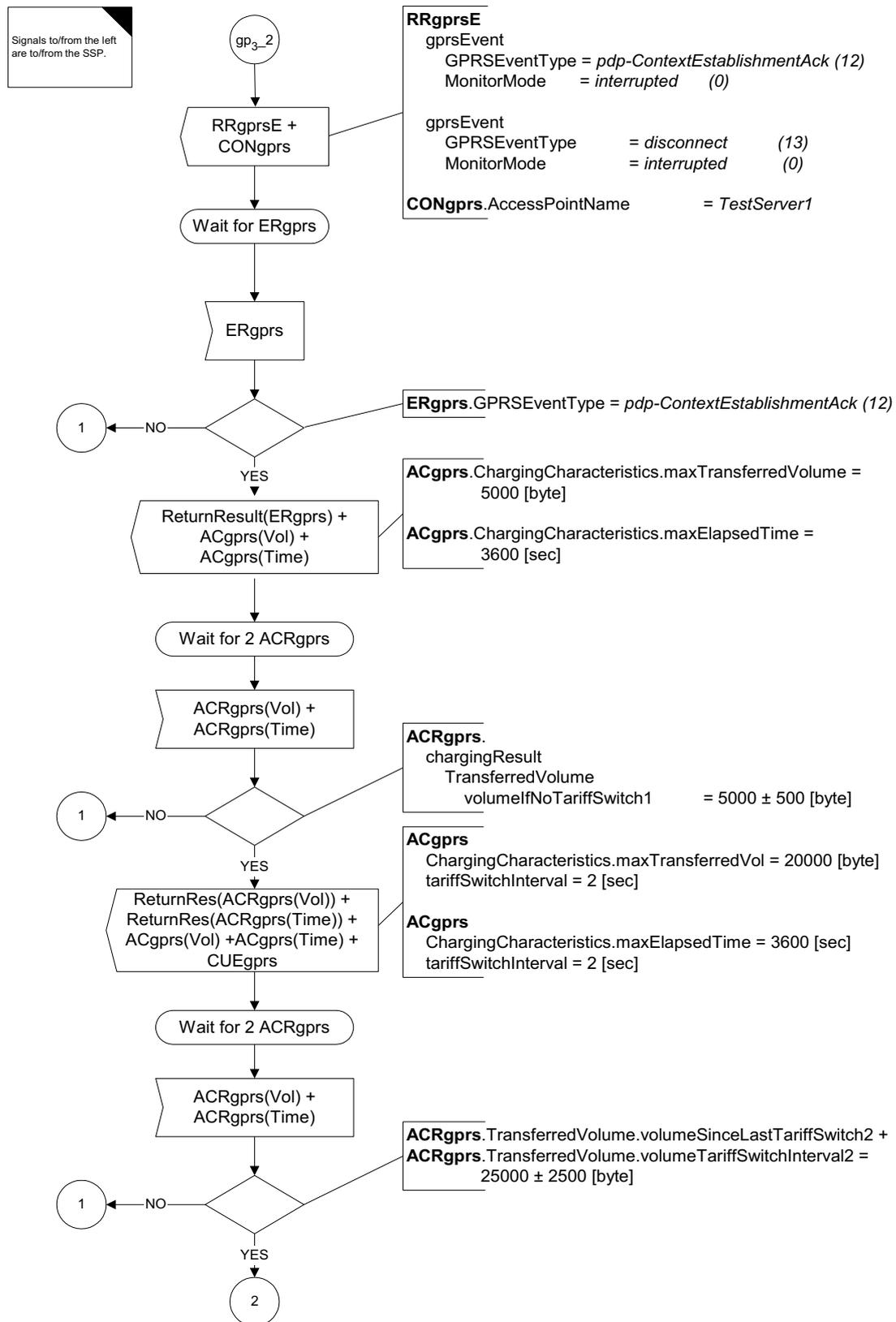
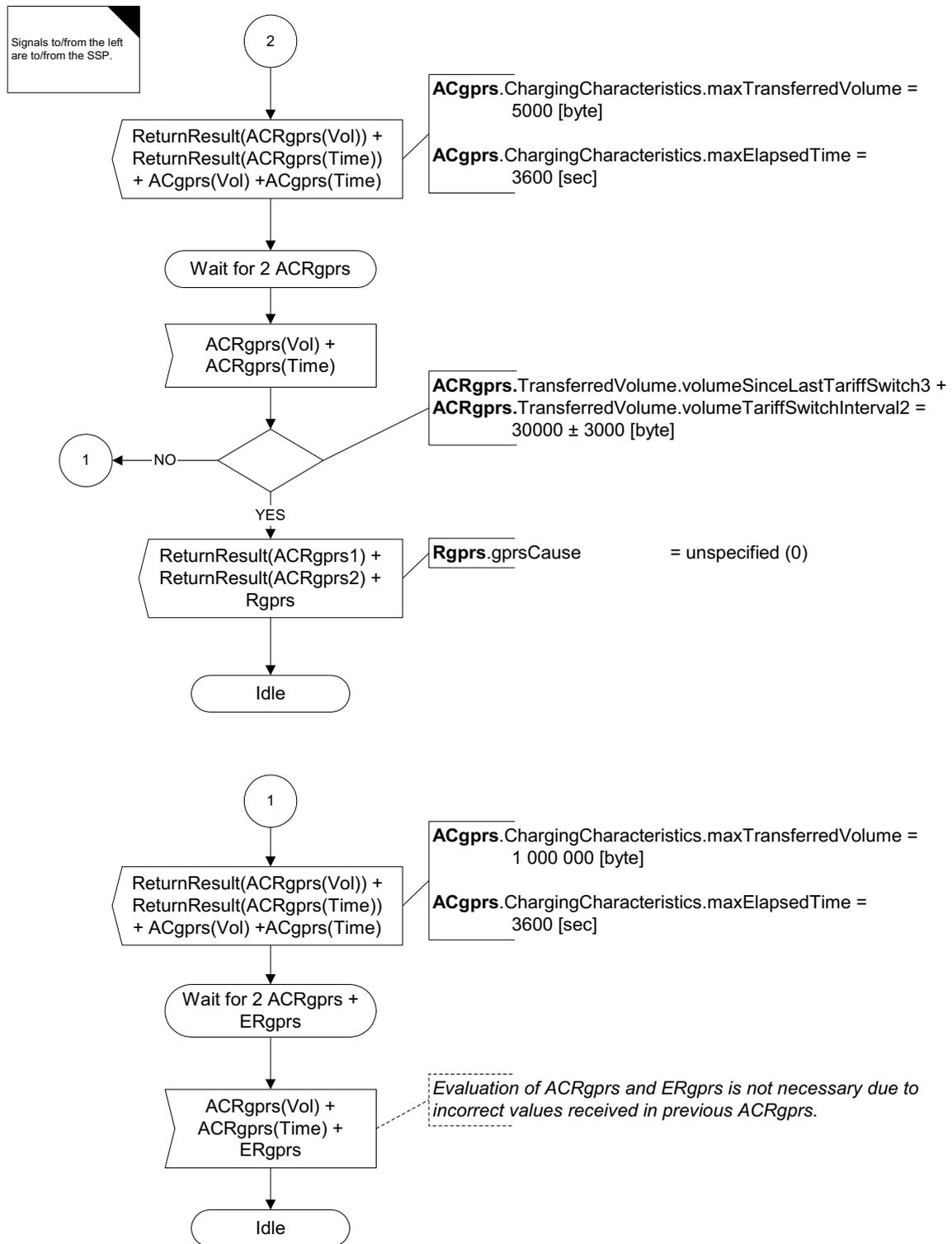


Figure 52: Check used Volume, 3 PDP context periods, tariffSwitch in 2nd period



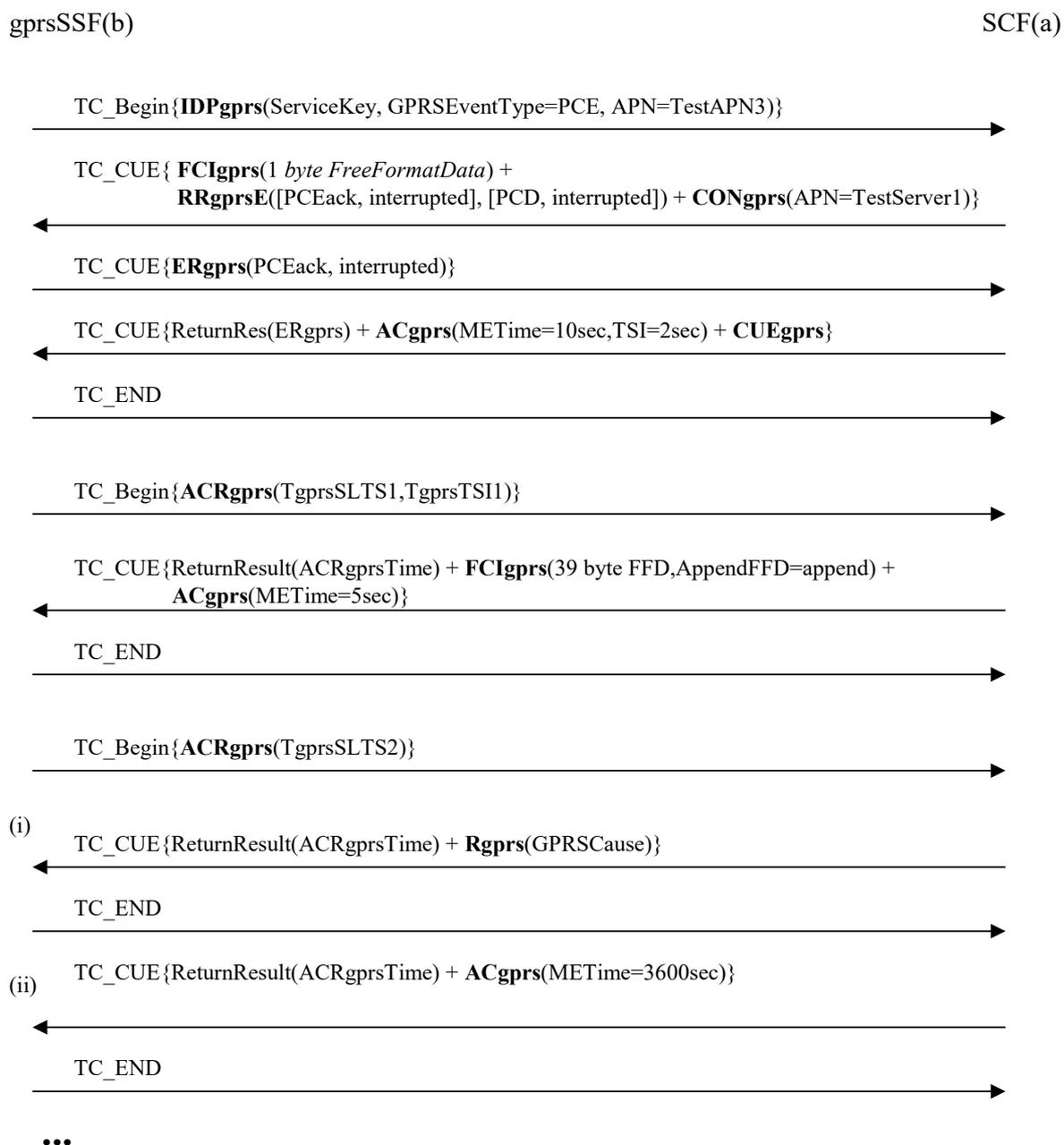
**Figure 53: Check used Volume, 3 PDP context periods, tariffSwitch in 2nd period (2)**

### 2.3.2.2.3 Check used Time, 2 PDP context periods, tariffSwitch in 1<sup>st</sup> period

Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), sets up a PDP context to *TestAPN3* and is connected to *TestServer1*. MS<sub>7</sub>(a) transfers data. A tariff switch occurs in the first PDP context period. If the elapsed time in the first and the second PDP context period is reported correctly SCF releases the PDP context after 15 seconds. Otherwise PDP context is continued.

Message-flow:



## Official Document IR.32 End-to-End Functional Capability Specification for Inter-PLMN CAMEL-Roaming

Preconditions:	<p>MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)</p> <p>No valid PDP contexts are established in MS<sub>7</sub>(a).</p> <p>MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).</p>
Action:	<p>MS<sub>7</sub>(a) performs "Activate PDP Context Request" to <i>TestAPN3</i></p> <p>MS<sub>7</sub>(a) transmits data using a service provided by HPLMN(a).</p>
Service logic:	<p>IDPgprs.accessPointName consists of <i>TestAPN3</i>:</p> <p>The SCF alters the APN to be that of Test Server 1 and sends FCIgprs(1byte FreeFormatData) + RRgprsE + CONgprs.</p> <p>When ERgprs(PCE-ack) is received SCF sends FCIgprs(39 byte FreeFormatData,AppendFFD=<i>append</i>) + ACgprs(METime=10sec,TSI=2sec) + CUEgprs.</p> <p>When ACRgprs(TgprsSLTS1,TgprsTSI) is received SCF sends ACgprs(METime=5sec)</p> <p>When ACRgprs(TgprsSLTS2) is received SCF sends</p> <p>(i) Rgprs if [TgprsTSI1 = 2 ± 1 sec] AND  [TgprsSLTS1 = 8 ± 1 sec] AND  [TgprsSLTS2 = 13 ± 1 sec]</p> <p>(ii) ACgprs(METime=3600sec) if transferred volume values are not received correctly.</p>
Result:	<p>(i) Successful result if data transfer is released after 15± 2 seconds.</p>
Comments:	<p>(ii) In any other case the test has failed.</p> <p>This test case confirms the correct reporting of elapsed time of two periods within a PDP context. A tariff switch occurs in the first PDP context period. The proper inter-working of FCIgprs can be verified through post-processing of TAP records in the HPLMN. The FreeFromatData sent in the second FCIgprs should be appended to the FreeFormatData of first FCIgprs. FreeFormatData are mapped to the parameter cselInformation in the TAP record.</p>

SCF Service Logic

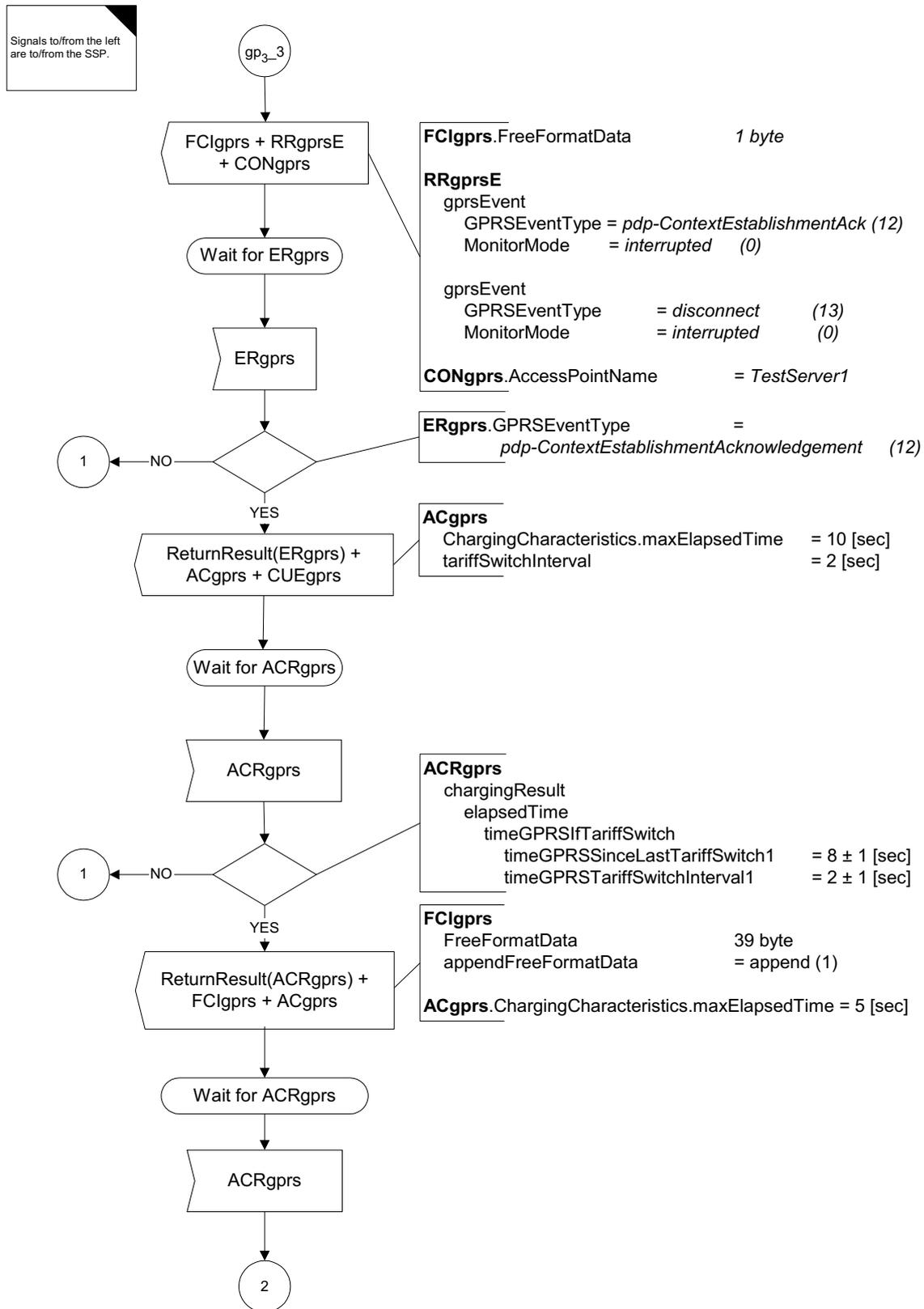


Figure 54: Check used Time, 2 PDP context periods, tariffSwitch in 1st period

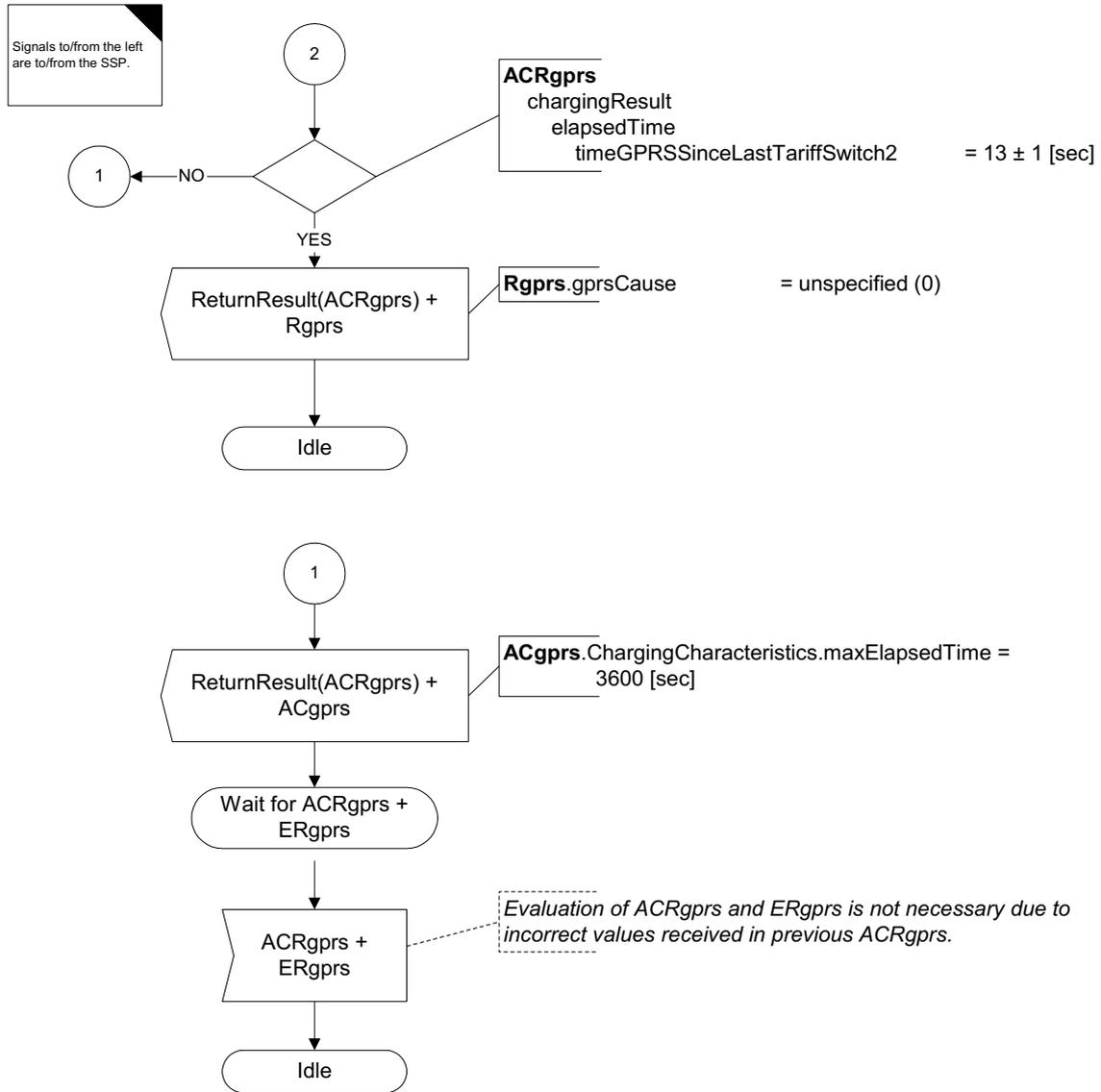


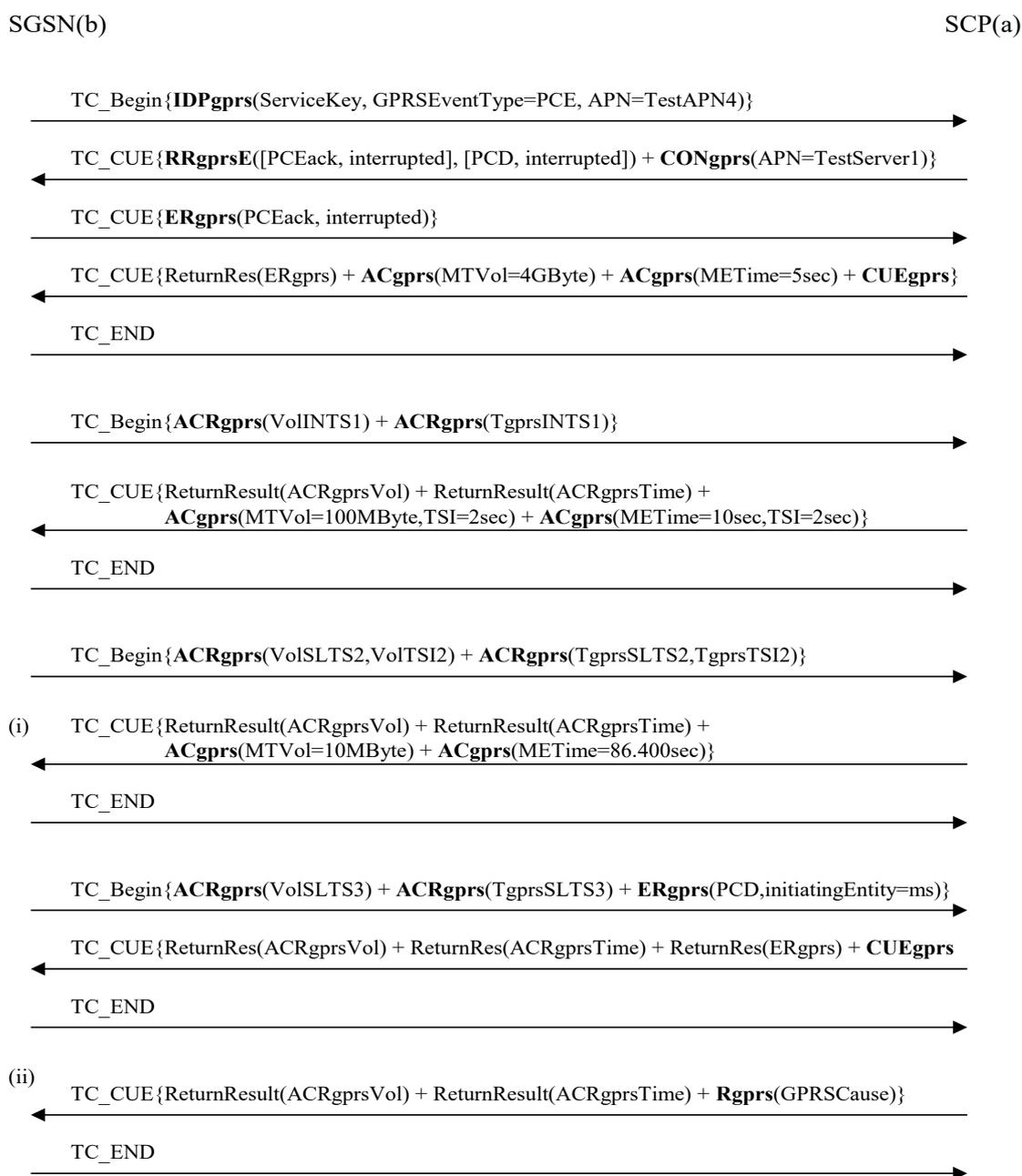
Figure 55: Check used Time, 2 PDP context periods, tariffSwitch in 1st period (2)

### 2.3.2.2.4 Check used Time, 3 PDP context periods, tariffSwitch in 2<sup>nd</sup> period

Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), sets up a PDP context to *TestAPN4* and is connected to *TestServer1*. MS<sub>7</sub>(a) transfers data. A tariff switch occurs in the second PDP context period. If the elapsed time in the first and the second PDP context periods is reported correctly SCF grants new time and volume and continues the PDP context. MS<sub>7</sub>(a) initiates PDP context disconnection.

Message-flow:



## Official Document IR.32 End-to-End Functional Capability Specification for Inter-PLMN CAMEL-Roaming

Preconditions:	<p>MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)</p> <p>No valid PDP contexts are established in MS<sub>7</sub>(a).</p> <p>MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).</p>
Action:	<p>MS<sub>7</sub>(a) performs "Activate PDP Context Request" to <i>TestAPN4</i></p> <p>MS<sub>7</sub>(a) transmits data using a service provided by HPLMN(a).</p> <p>MS<sub>7</sub>(a) disconnects the PDP context after 30 seconds.</p>
Service logic:	<p>IDPgprs.accessPointName consists of <i>TestAPN4</i>:</p> <p>The SCF alters the APN to be that of Test Server 1 and sends RRgprsE + CONgprs.</p> <p>When ERgprs(PCE-ack) is received SCF sends ACgprs(MTVol=4GByte) + ACgprs(METime=5sec) + CUEgprs.</p> <p>When ACRgprs(VolINTS1) + ACRgprs(TgprsINTS1) is received SCF sends ACgprs(MTVol=100MByte,TSI=2sec) + ACgprs(METime=10sec,TSI=2sec)</p> <p>When ACRgprs(VolSLTS2,VolTSI2) + ACRgprs(TgprsSLTS2,TgprsTSI2) is received SCF sends</p> <p>(i) ACgprs(MTVol=10MByte) + ACgprs(METime=86400sec) if            [TgprsINTS1 = 5 ± 1 sec] AND            [TgprsTSI2 = 7 ± 1 sec] AND            [TgprsSLTS2 = 8 ± 1 sec]</p> <p>(ii) Rgprs if the elapsed time values are not reported correctly.</p>
Result:	<p>(i) Successful result if PDP context remains active for more than 20 seconds.</p> <p>(ii) In any other case the test has failed.</p>
Comments:	<p>This test case confirms the correct reporting of transferred volume of two periods within a PDP context. A tariff switch occurs in the second PDP context period.</p> <p>It is also possible for the tester to check whether the GPRSevent Disconnect has been properly reported to the SCF by checking the ERgprs message after MS<sub>7</sub>(a) has disconnected the PDP context. For this it is necessary to use a Protocol Analyser. This part of the test case is optional.</p>

SCF Service Logic

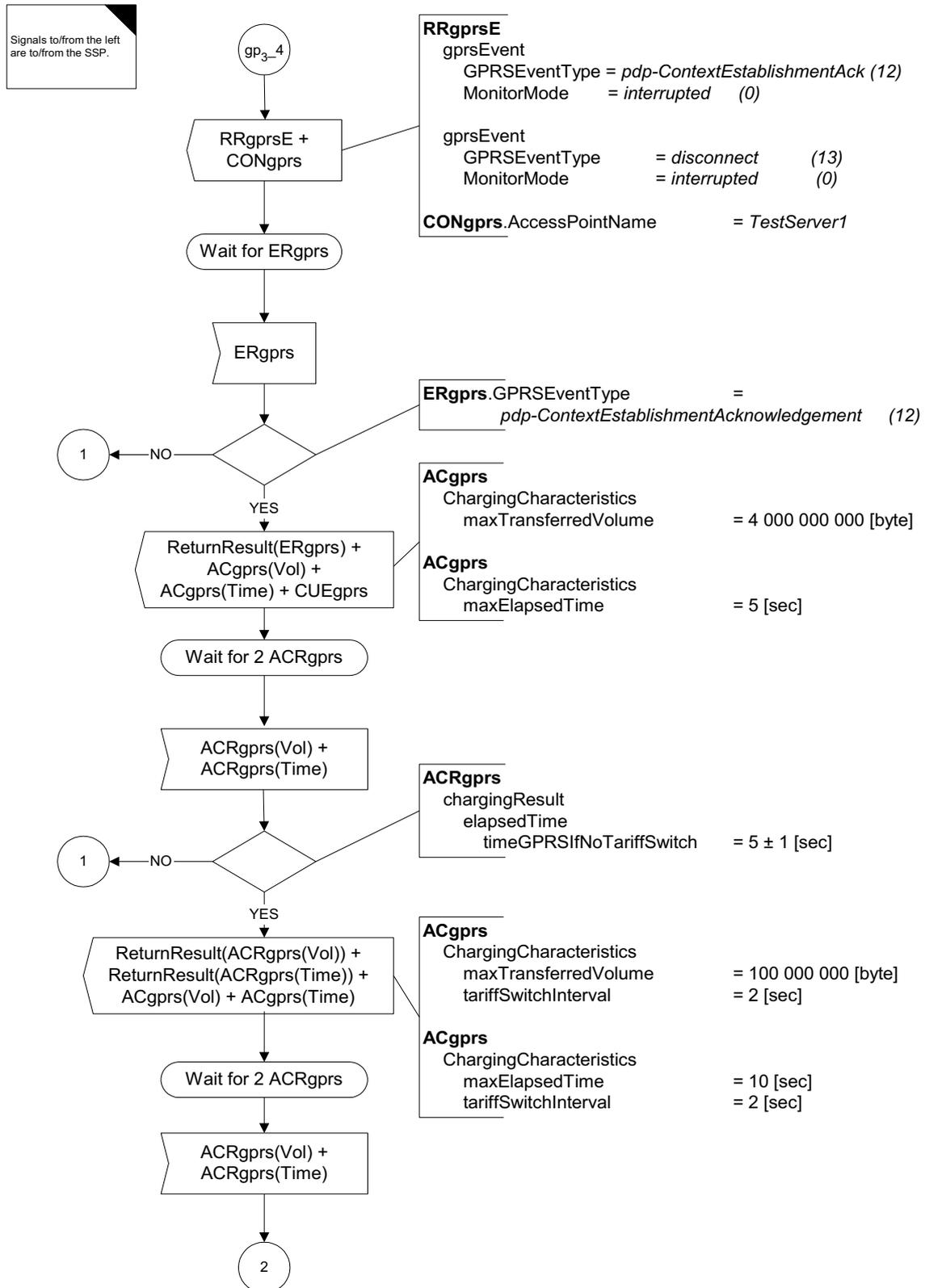
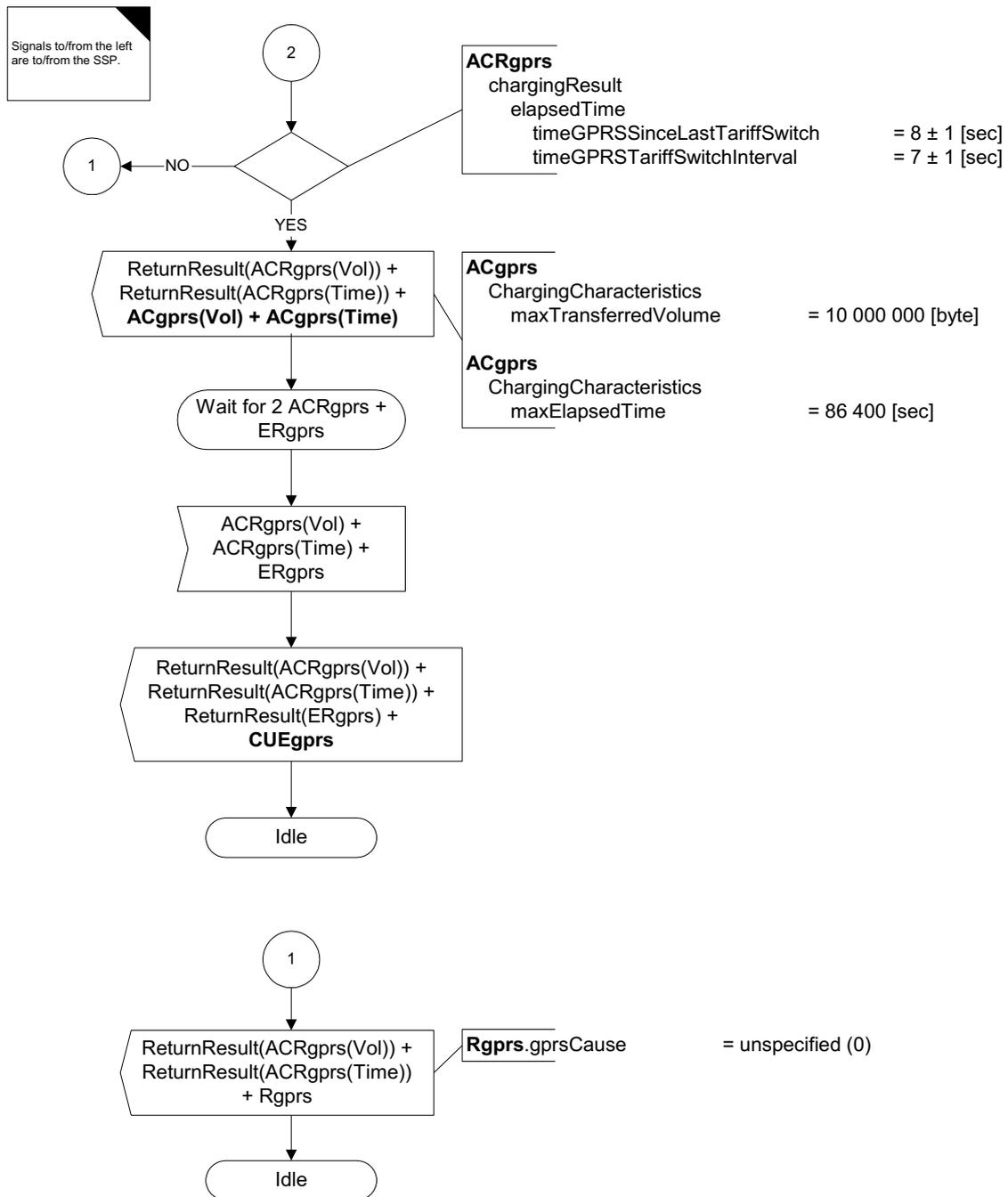


Figure 56: Check used Time, 3 PDP context periods, tariffSwitch in 2nd period



**Figure 57: Check used Time, 3 PDP context periods, tariffSwitch in 2nd period (2)**

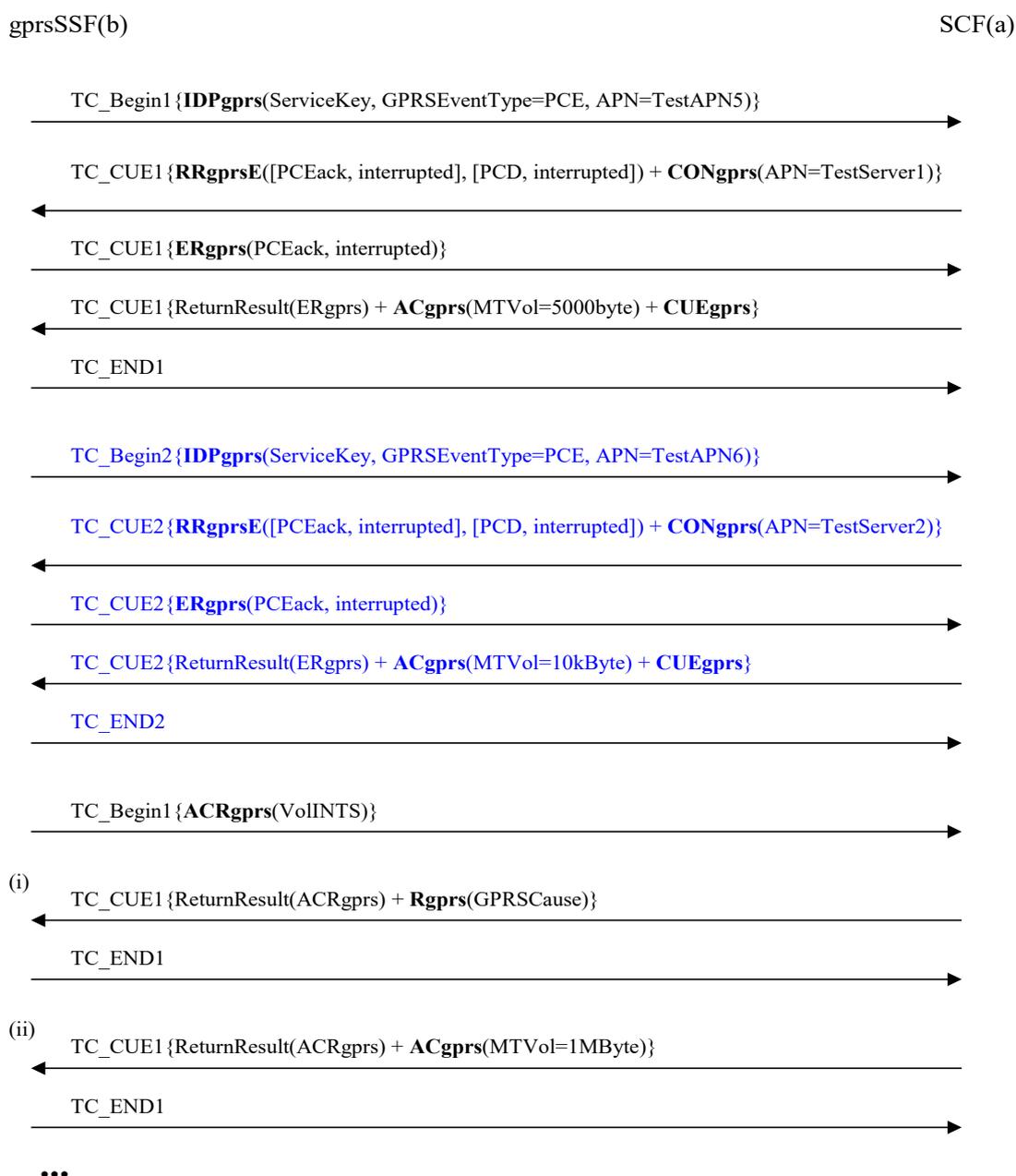
### 2.3.2.2.5 Parallel GPRS dialogues using GPRS CAMEL Scenario 2 (optional)

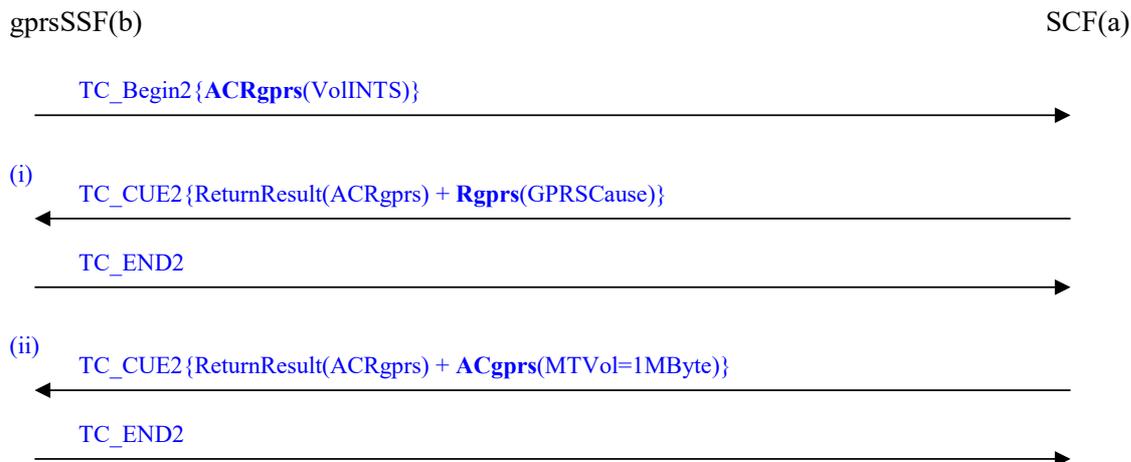
Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), sets up one GPRS dialogue to *TestAPN5* which is connected to *TestServer1* and a second GPRS dialogue to *TestAPN6* which is connected to *TestServer2*. MS<sub>7</sub>(a) transfers data. If the transferred volume for both PDP contexts is reported correctly SCF releases the GPRS dialogues. Otherwise the PDP contexts are continued.

This scenario is difficult to realise because of MS restrictions. A scenario is parallel use of WAP and Internet Access using Terminal Equipment. However, means for calculating the number of packets for both PDP Contexts are required.

Message-flow:





...

**Preconditions:** MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)  
 No valid PDP contexts are established in MS<sub>7</sub>(a).  
 MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).

**Action:** MS<sub>7</sub>(a) performs "Activate PDP Context Request" to *TestAPN5*  
 MS<sub>7</sub>(a) performs "Activate PDP Context Request" to *TestAPN6*  
 MS<sub>7</sub>(a) transmits data using a service provided by HPLMN(a) within PDP Context 1.  
 MS<sub>7</sub>(a) transmits data using a service provided by HPLMN(a) within PDP Context 2.

**Service logic:** IDPgprs.accessPointName consists of *TestAPN5*:  
 The SCF alters the APN to be that of Test Server 1 and sends RRgprsE + CONgprs.  
 When ERgprs(PCE-ack) is received SCF sends ACgprs(MTVol=5.000byte) + CUEgprs.  
 When ACRgprs(VolINTS) is received SCF sends

(i) Rgprs if VolINTS = 5.000 ± 500 byte

(ii) ACgprs(MTVol=1.000.000byte) if transferred volume value is not received correctly.

IDPgprs.accessPointName consists of *TestAPN6*:  
 The SCF alters the APN to be that of Test Server 2 and sends RRgprsE + CONgprs.  
 When ERgprs(PCE-ack) is received SCF sends ACgprs(MTVol=10.000byte) + CUEgprs.  
 When ACRgprs(VolINTS) is received SCF sends

(i) Rgprs if VolINTS = 10.000 ± 1.000 byte

(ii) ACgprs(MTVol=1.000.000byte) if transferred volume value is not received correctly.

**Result:** (i) Successful result if both GPRS dialogues are released after transmission of 15.000 ± 1.500 byte in total.

(ii) In any other case the test has failed.

Comments: This test case confirms the correct reporting of transferred volume of two parallel GPRS dialogues. It is difficult to execute this test. It is required that the tester is able to set up two PDP contexts in parallel and to count the transmitted data for each PDP context.

SCF Service Logic

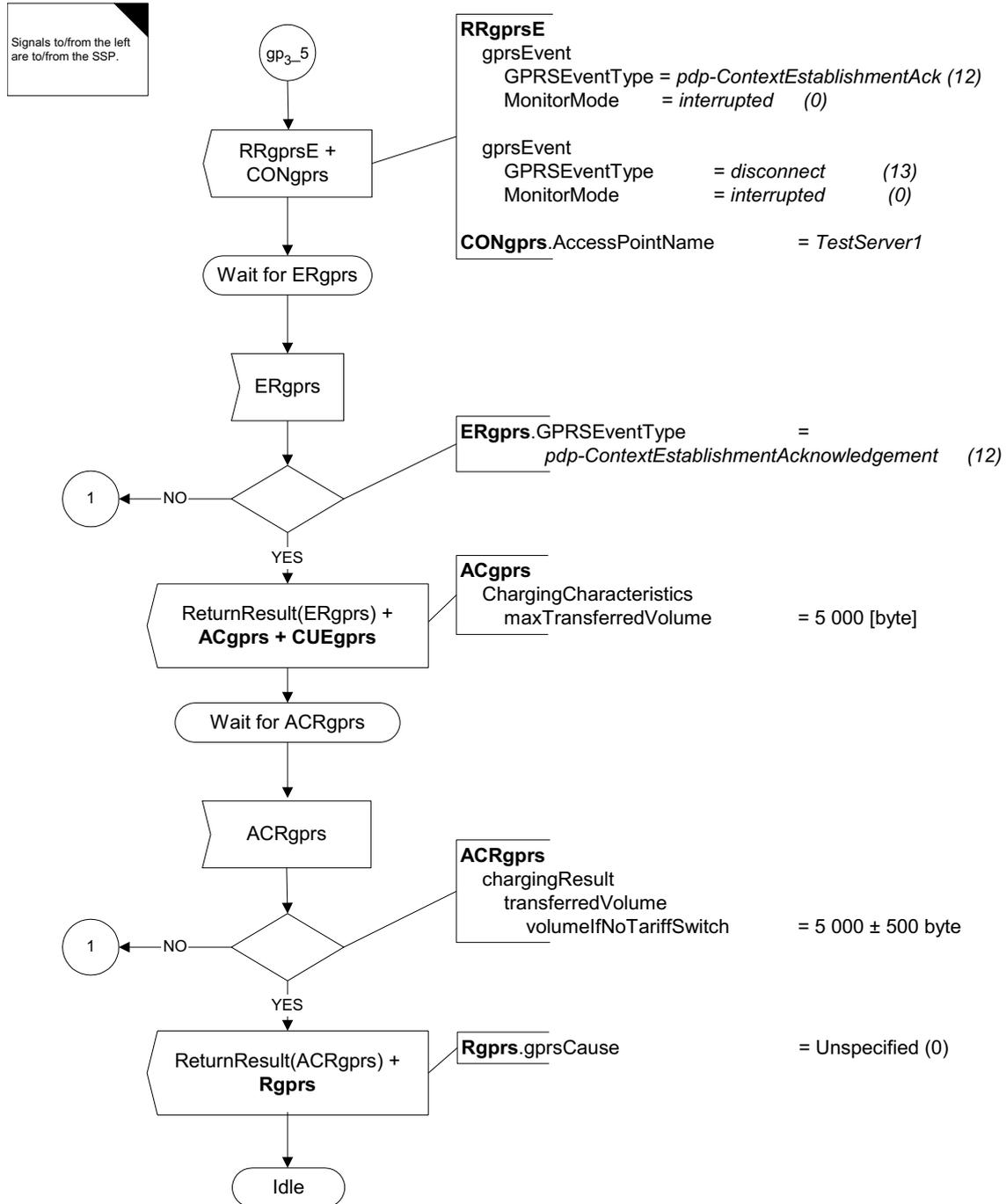


Figure 58: 2.3.2.2.5 Parallel GPRS dialogues using GPRS CAMEL Scenario

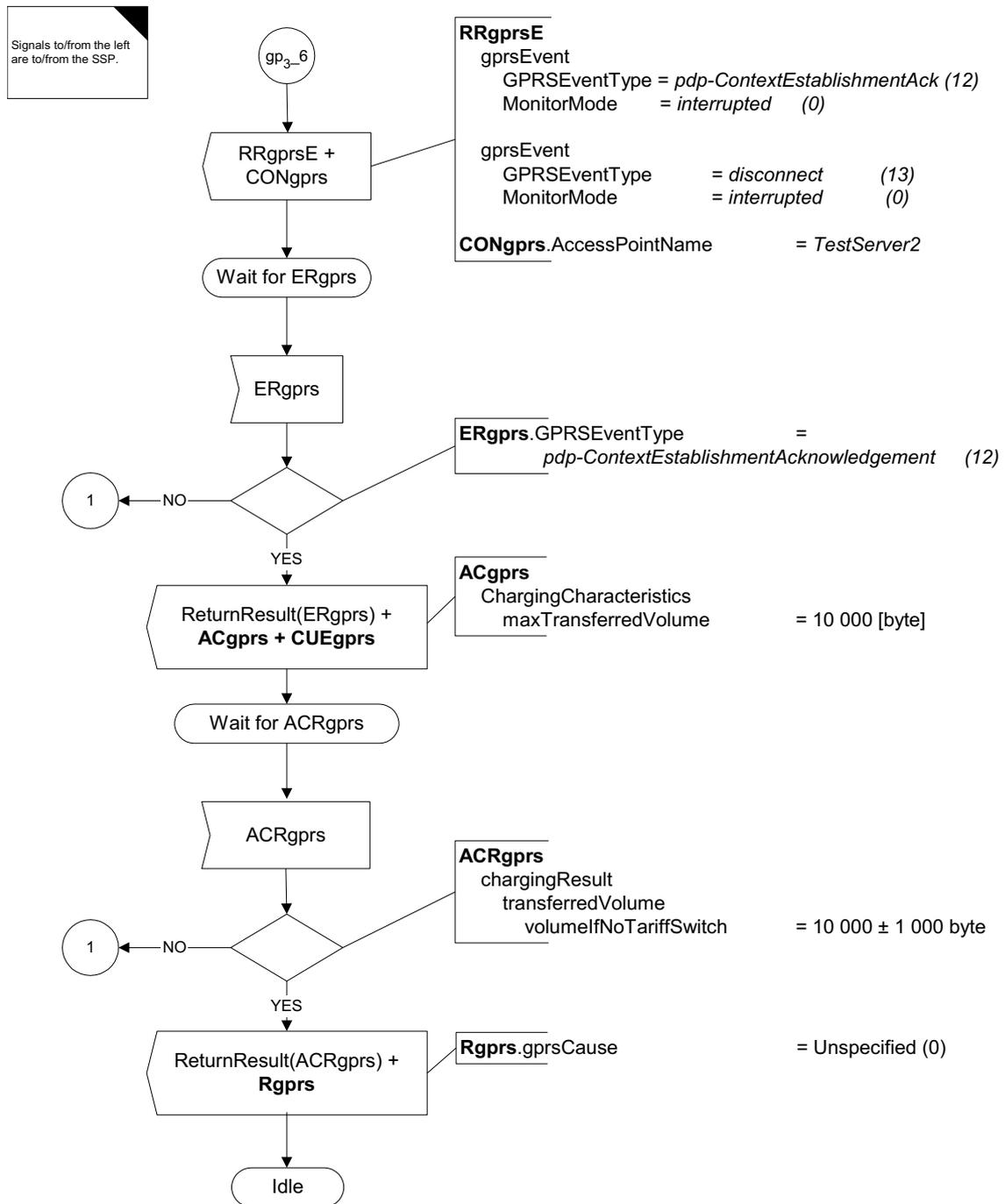


Figure 59: 2.3.2.2.5 Parallel GPRS dialogues using GPRS CAMEL Scenario (2)

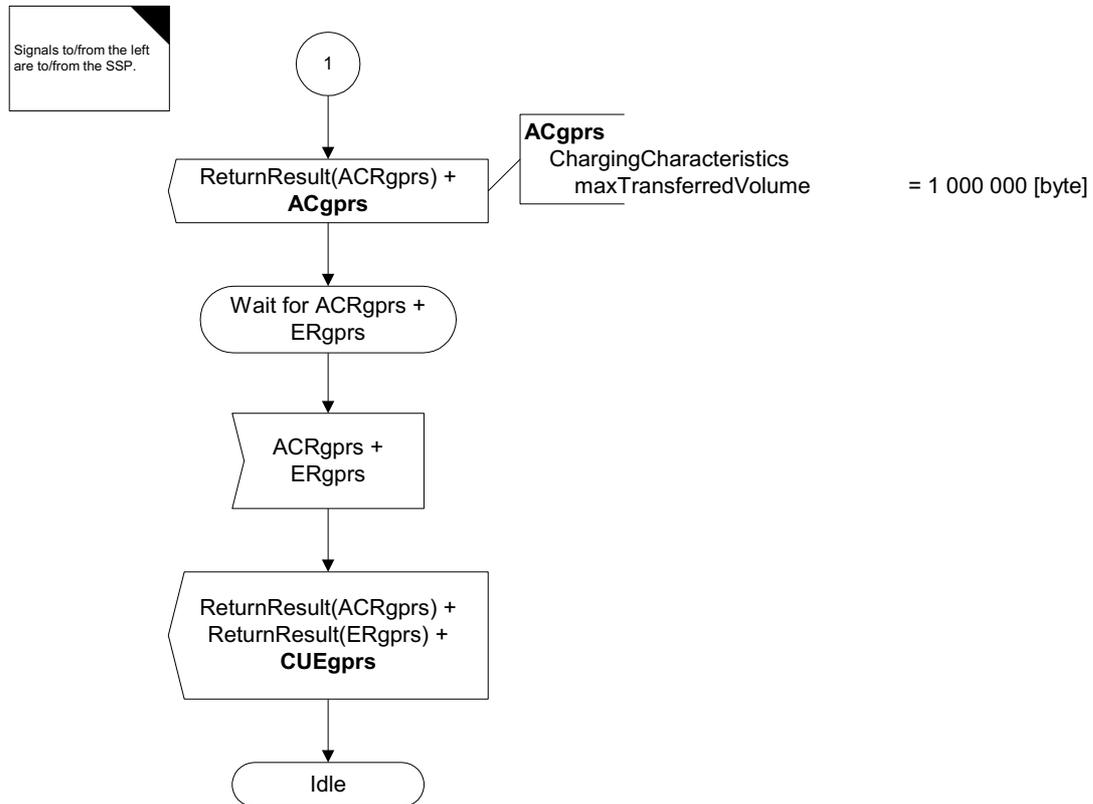
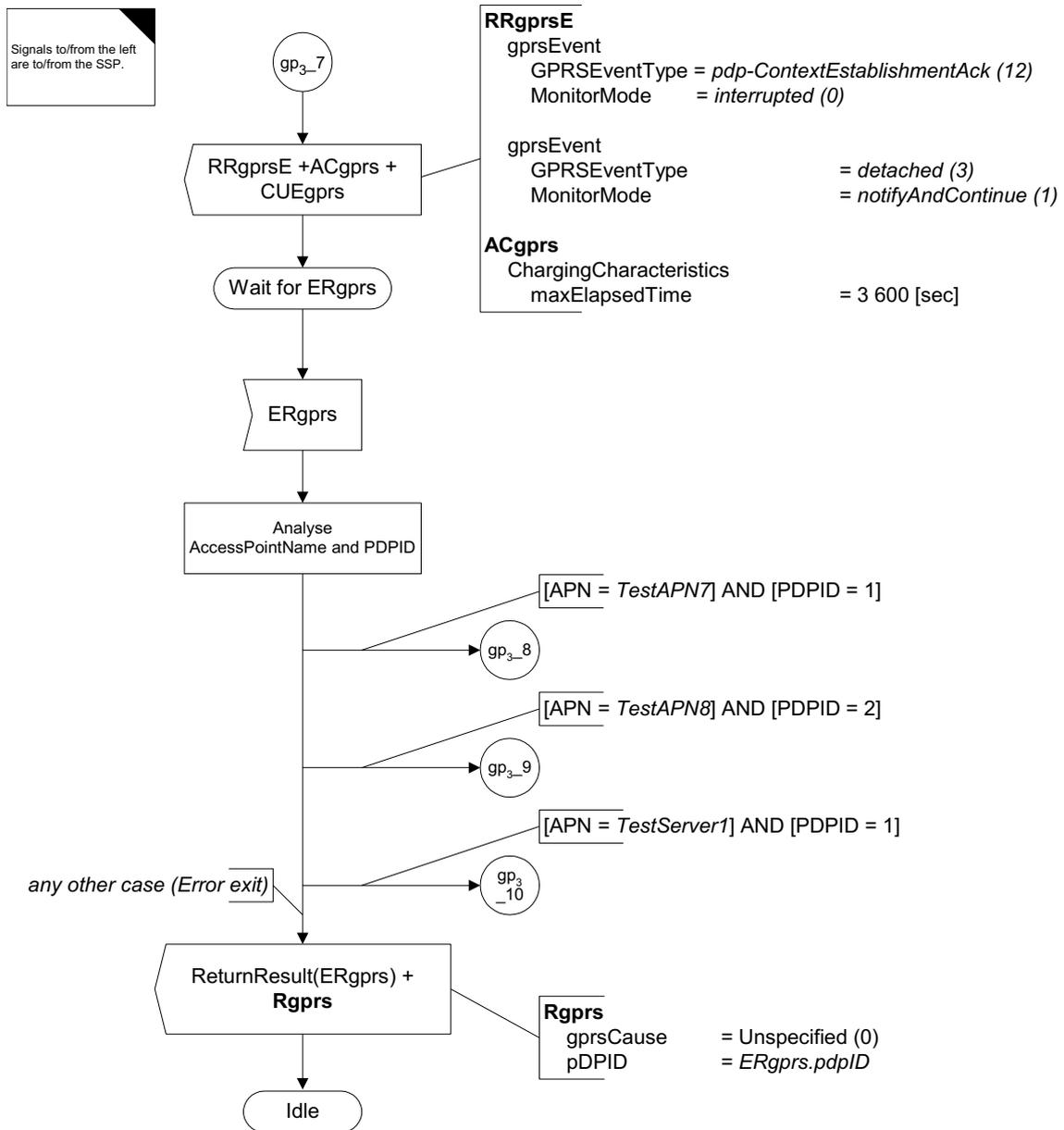


Figure 60: 2.3.2.2.5 Parallel GPRS dialogues using GPRS CAMEL Scenario (3)

### 2.3.2.3 CAMEL Scenario 1

#### Entry Service Logic



**Figure 61: Entry process for CAMEL Phase 3 Scenario 1**

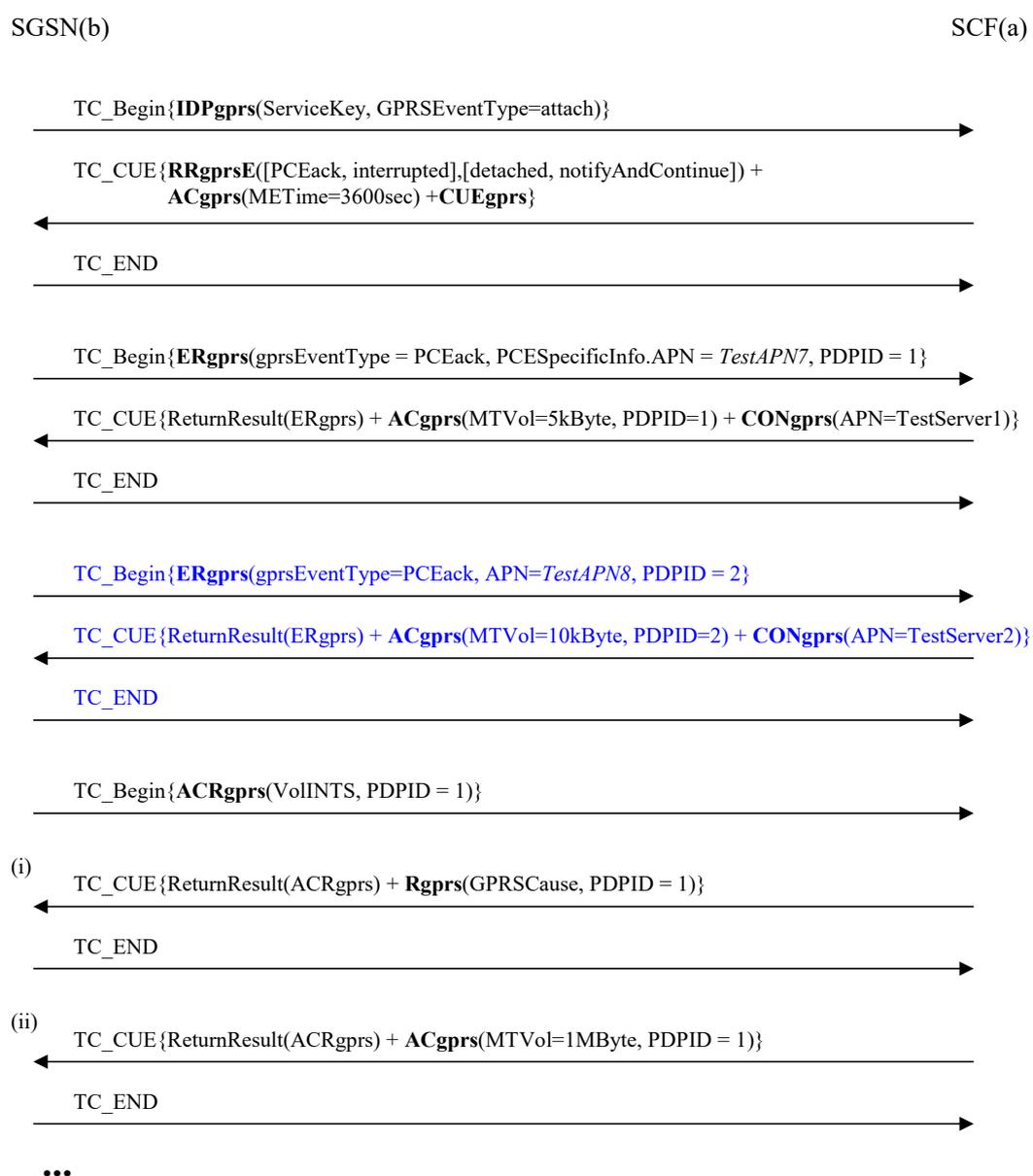
### 2.3.2.3.1 Parallel PDP contexts using GPRS CAMEL Scenario 1 (optional)

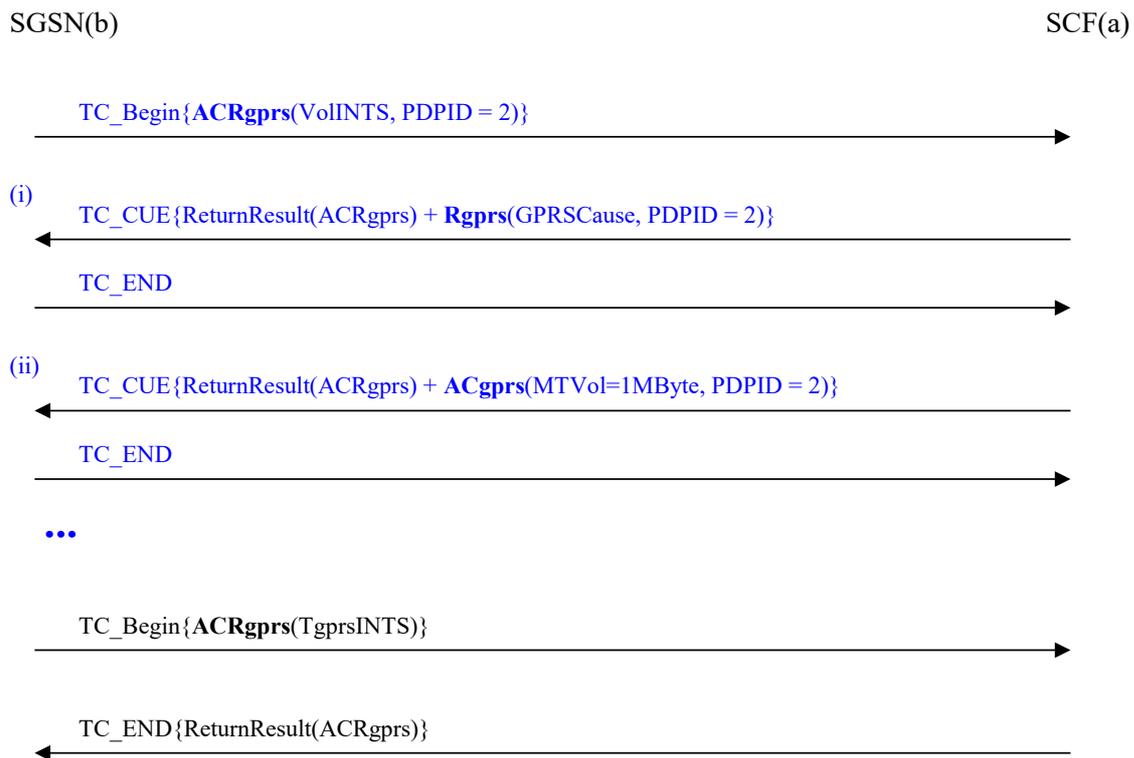
Overview:

MS<sub>8</sub>(a), GPRS attached in VPLMN(b), sets up one PDP context to *TestAPN7* which is connected to *TestServer1* and a second PDP context to *TestAPN8* which is connected to *TestServer2*. MS<sub>8</sub>(a) transfers data. If the transferred volume in the both PDP contexts is reported correctly SCF releases the PDP contexts. Otherwise the PDP contexts are continued.

This scenario is difficult to realize because of MS restrictions. A scenario is parallel use of WAP and Internet Access using Terminal Equipment. However, means for calculating the number of packets for both PDP Contexts are required.

Message-flow:





**Preconditions:** MS<sub>s</sub>(a) is switched off.  
 MS<sub>s</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).

**Action:** Switch on MS<sub>s</sub>(a) and perform GPRS-Attach.  
 MS<sub>s</sub>(a) performs "Activate PDP Context Request" to *TestAPN7*  
 MS<sub>s</sub>(a) performs "Activate PDP Context Request" to *TestAPN8*  
 MS<sub>s</sub>(a) transmits data using a service provided by HPLMN(a) within PDP Context 1.  
 MS<sub>s</sub>(a) transmits data using a service provided by HPLMN(a) within PDP Context 2.  
 Switch off MS<sub>s</sub>(a) to perform a GPRSdetach.  
 If HPLMN(a) has indicated that SCF-initiated SMS is supported: Switch on MS<sub>s</sub>(a) to receive SM.

**Service logic:** IDPgprs.gprsEventType equals *attach*:  
 The SCF sends RRgprsE + ACgprs(METime=3600sec) + CUEgprs.  
 When ERgprs(PCE-ack, APN=*TestAPN7*, PDPID=1) is received SCF alters the APN to be that of *Test Server 1* and sends ACgprs(MTVol=5.000byte, PDPID=1) + CONgprs.  
 When ACRgprs(VolINTS, PDPID=1) is received SCF sends

(i) Rgprs if VolINTS = 5.000 ± 500 byte

(ii) ACgprs(MTVol=1.000.000byte) if transferred volume value is not received correctly.

When ERgprs(PCE-ack, APN=*TestAPN8*, PDPID=2) is received SCF alters the APN to be that of *Test Server 2* and sends ACgprs(MTVol=10.000byte, PDPID=2) + CONgprs.  
 When ACRgprs(VolINTS, PDPID=2) is received SCF sends

(i) Rgprs if VolINTS =  $10.000 \pm 1.000$  byte

(ii) ACgprs(MTVol=1.000.000byte) if transferred volume value is not received correctly.

**Optional:** After reception of ACRgprs(TgprsINTS) the SCF initiates the transmission of a SM to MS<sub>s</sub>(a) with the following content: "ACgprs has been sent to SCF. SGSN(b) reported that MS<sub>s</sub>(a) was attached for <ACRgprs.TgprsINTS> seconds."

Result:

(i) Successful result if both PDP contexts are released after transmission of  $15.000 \pm 1.500$  byte.

Comments:

(ii) In any other case the test has failed.

This test case confirms the correct reporting of transferred volume of two PDP contexts within one GPRS dialogue.

The correct reporting of the duration MS<sub>s</sub>(a) was attached can be checked in the following way:

1. If HPLMN has indicated that SCF-initiated SMS is used: MS<sub>s</sub>(a) will receive an appropriate SM. If possible HPLMN will include the duration reported from SGSN(b).

2. HPLMN may compare this value with the duration the tester measured.

This part of the test case is optional and the HPLMN may judge the result.

SCF Service Logic

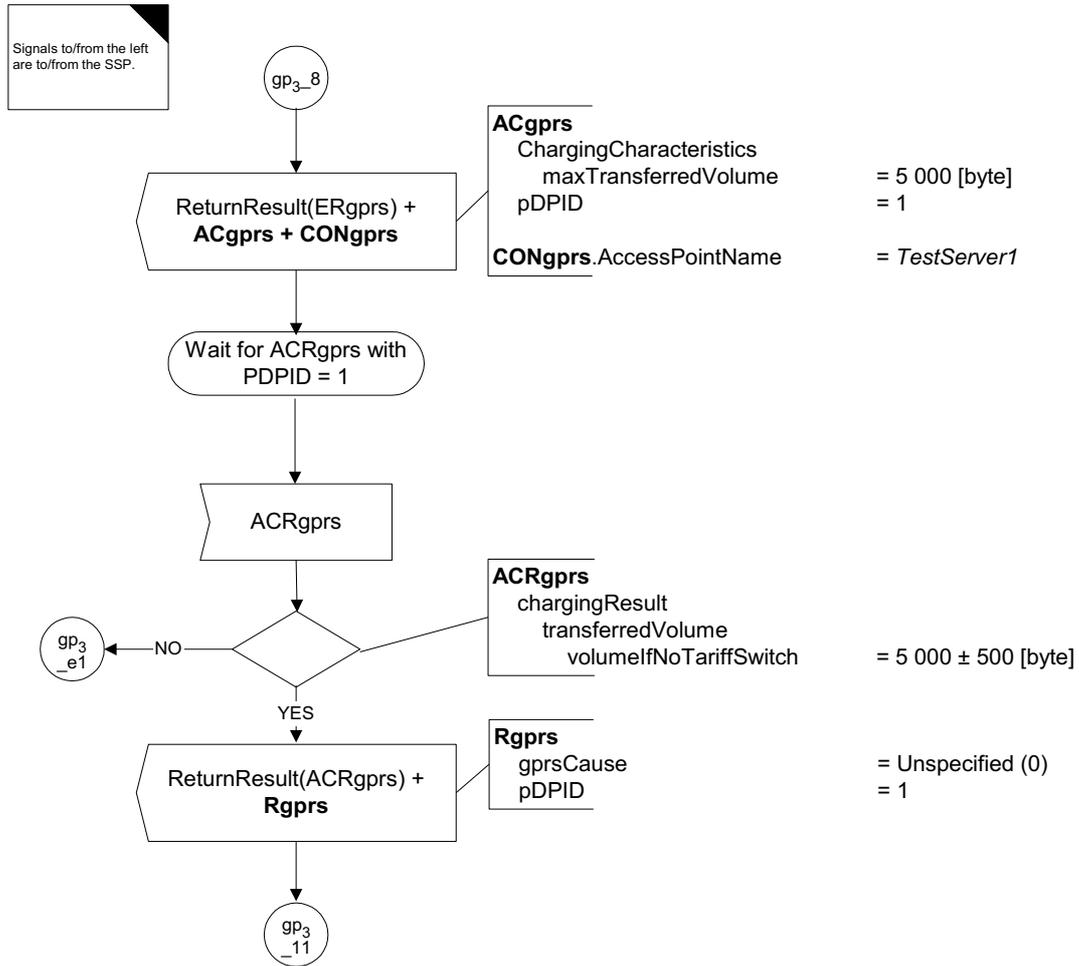


Figure 62: 2.3.2.3.1 Parallel PDP contexts using GPRS CAMEL Scenario

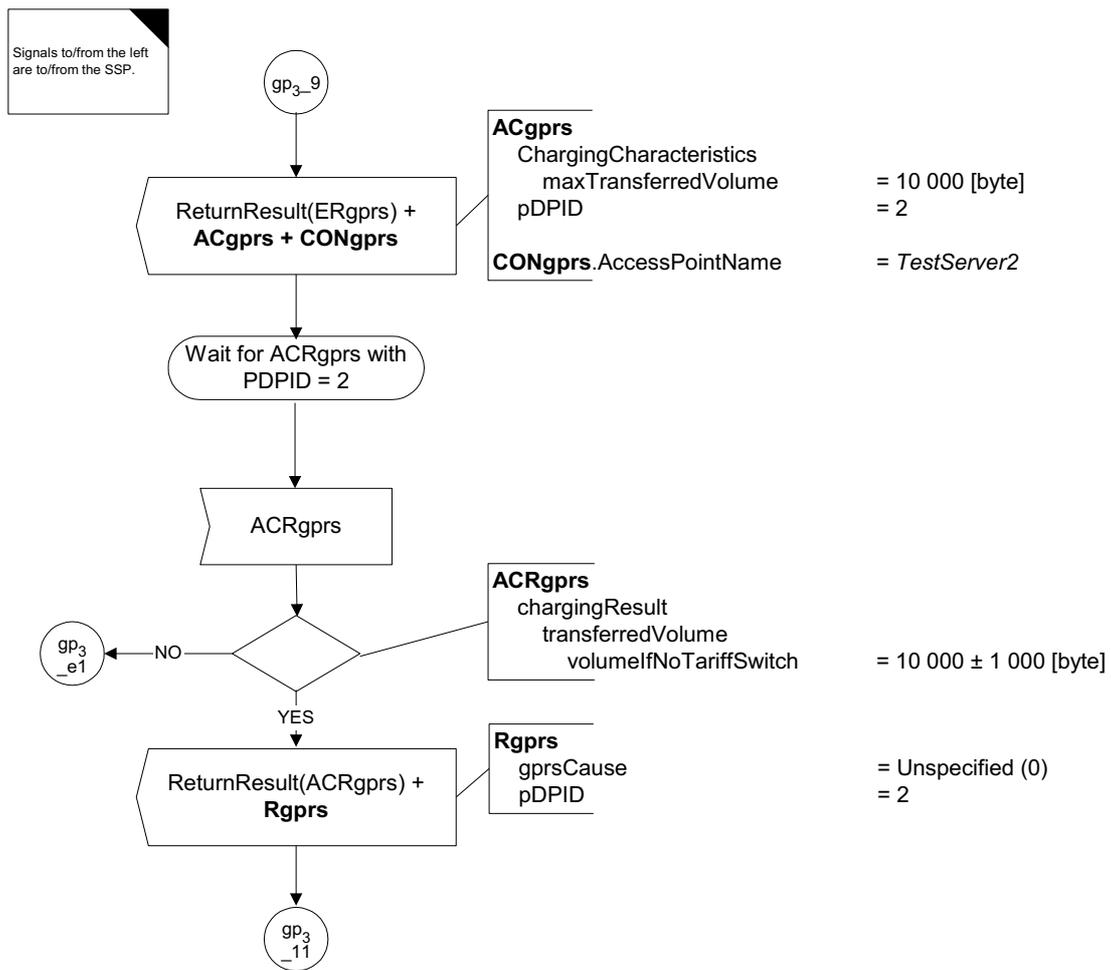
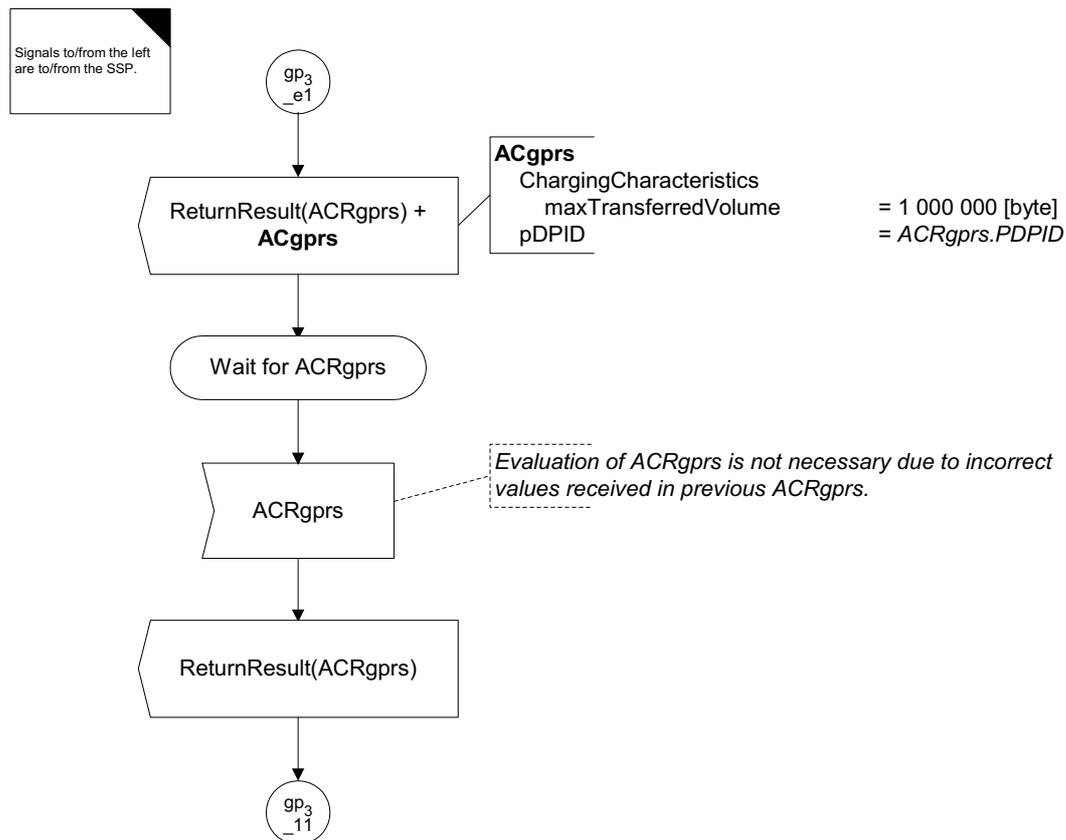
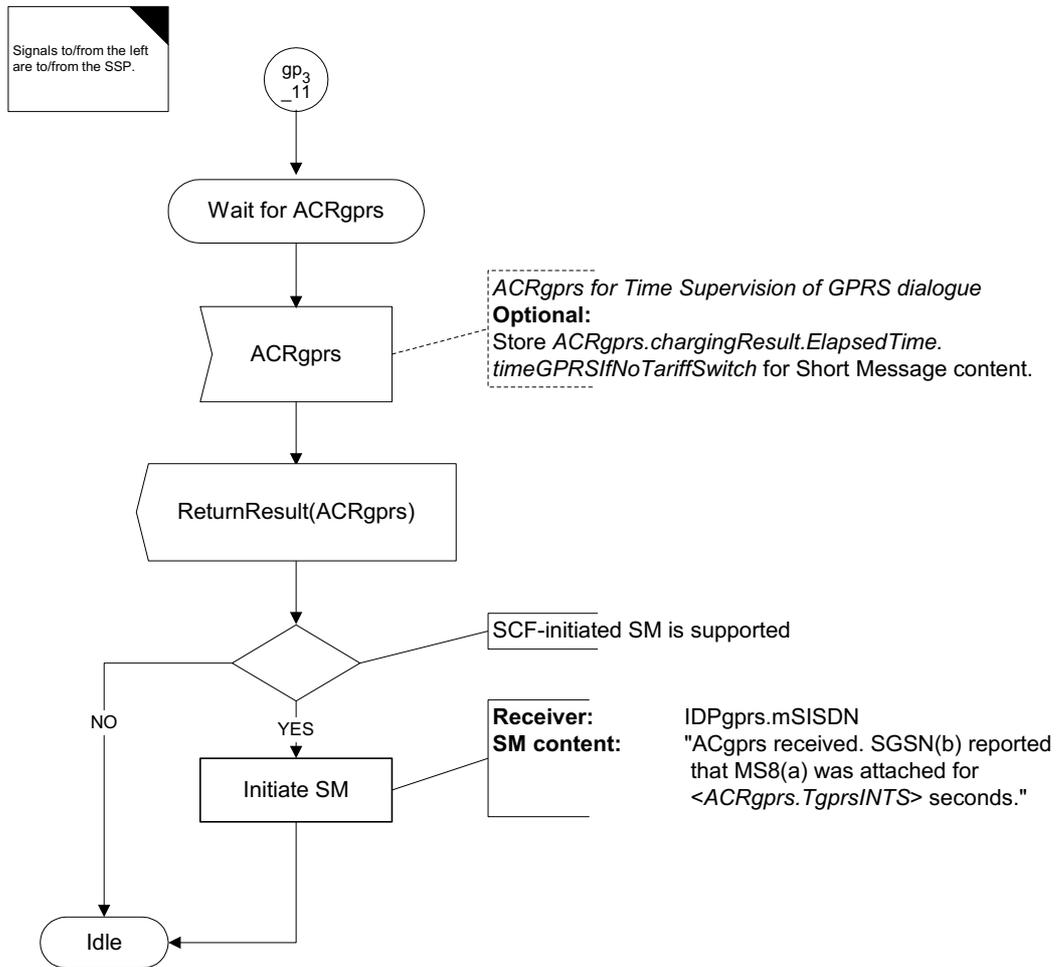


Figure 63: 2.3.2.3.1 Parallel PDP contexts using GPRS CAMEL Scenario (2)



**Figure 64: 2.3.2.3.1 Parallel PDP contexts using GPRS CAMEL Scenario (3)**



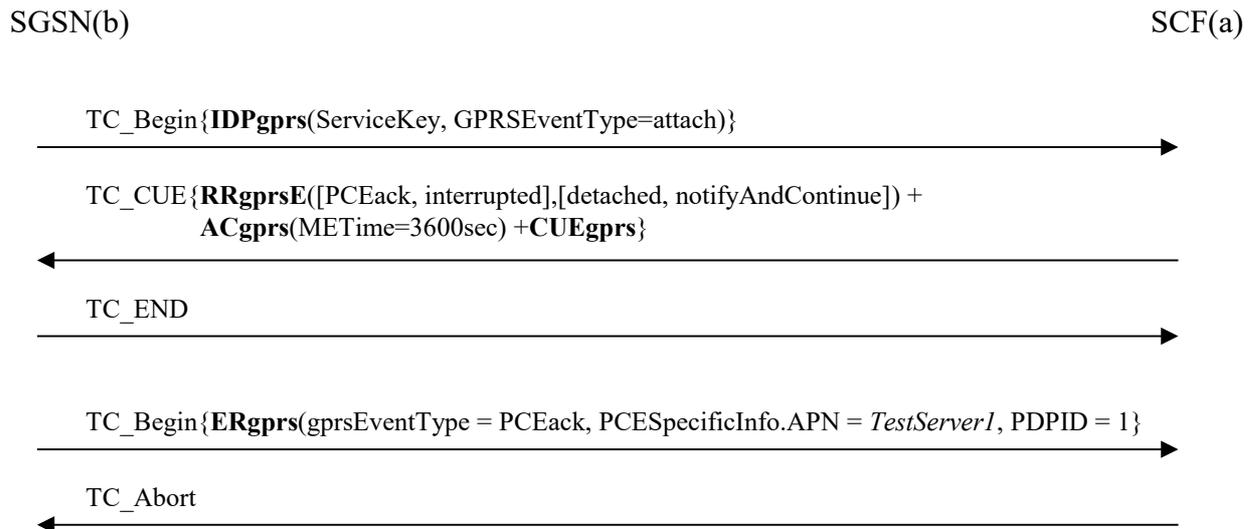
**Figure 65: 2.3.2.3.1 Parallel PDP contexts using GPRS CAMEL Scenario (4)**

### 2.3.2.3.2 Check Default GPRS handling set to continue

Overview:

MS<sub>8</sub>(a), GPRS attached in VPLMN(b), sets up a PDP context to *TestServer1*. SCF responds to ERgprs(PCEack) with TCAP Abort. The defaultGPRShandling of MS<sub>8</sub>(a) equals continue. If PDP context is established the test is passed.

Message-flow:



**Preconditions:** MS<sub>8</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)  
 No valid PDP contexts are established in MS<sub>8</sub>(a).  
 MS<sub>8</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).

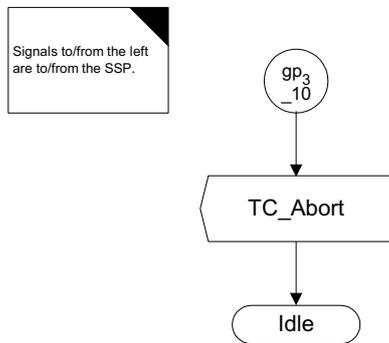
**Action:** MS<sub>8</sub>(a) performs "Activate PDP Context Request" to *TestServer1*

**Service logic:** IDPgprs.gprsEventType equals *attach*:  
 The SCF sends RRgprsE + ACgprs(METime=3600sec) + CUEgprs.  
 When ERgprs(PCE-ack, APN=*TestServer1*, PDPID=1) is received SCF sends TCAP Abort.

**Result:** (i) Successful result if the PDP context is established.

**Comments:** (ii) In any other case the test has failed.  
 This test case confirms the correct utilization of the GPRS-CSI parameter defaultGPRShandling=continue.

SCF Service Logic



**Figure 66: Check Default GPRS handling set to continue**

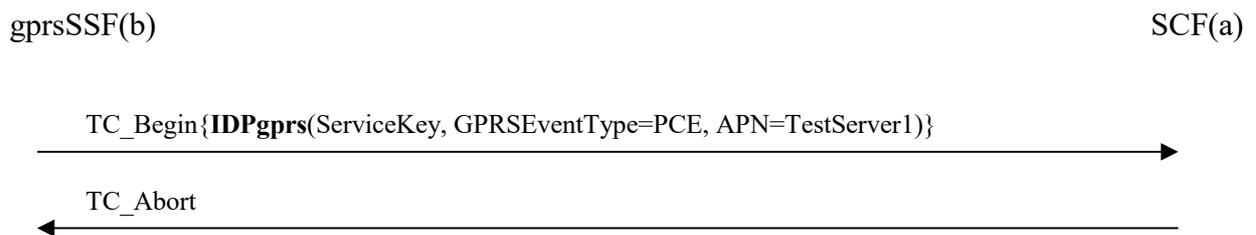
### 2.3.2.4 Check Default GPRS handling set to release within CAMEL Scenario 2

#### 2.3.2.4.1 Abort during PDP context establishment

Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), attempts to set up a PDP context to *TestServer1*. SCF responds to ERB(PCEack) with TCAP Abort. The defaultGPRShandling of MS<sub>7</sub>(a) equals release. If PDP context is **NOT** established the test is passed.

Message-flow:



**Preconditions:** MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)  
 No valid PDP contexts are established in MS<sub>7</sub>(a).  
 MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).

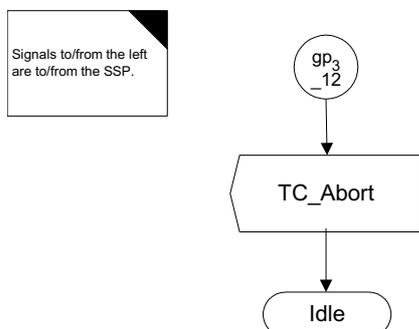
**Action:** MS<sub>7</sub>(a) performs "Activate PDP Context Request" to *TestServer1*

**Service logic:** IDPgprs.accessPointName consists of *TestServer1*:  
 SCF sends TCAP Abort

**Result:** (i) Successful result if the PDP context is NOT established and MS<sub>7</sub>(a) is **NOT** connected to *TestServer1*.  
 (ii) In any other case the test has failed.

**Comments:** This test case confirms the correct utilization of the GPRS-CSI parameter defaultGPRShandling=release in case PDP context establishment is aborted.

SCF Service Logic



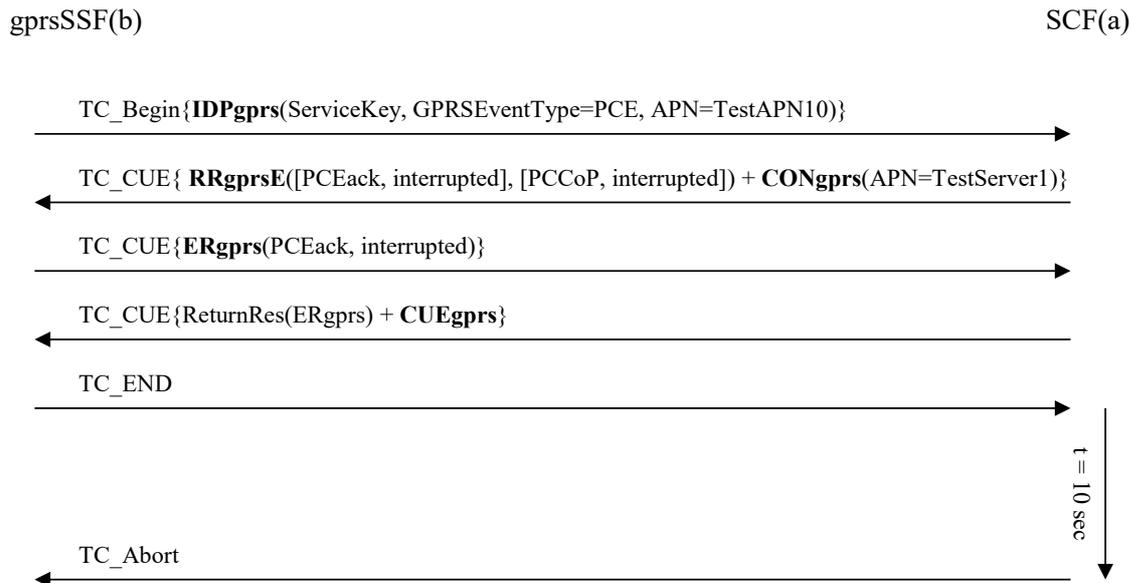
**Figure 68: Abort during PDP context establishment**

### 2.3.2.4.2 Abort during active PDP context

Overview:

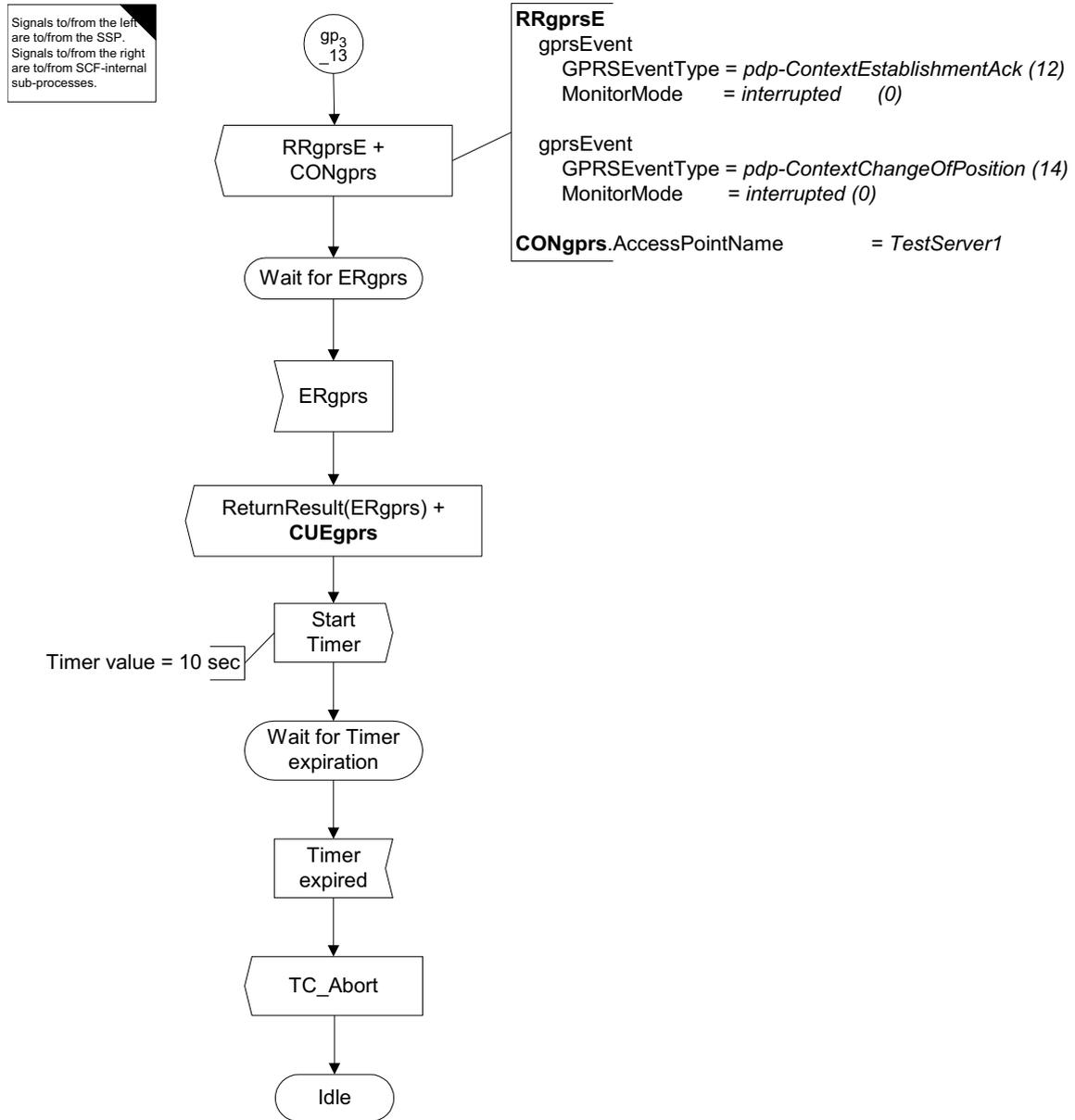
MS<sub>7</sub>(a), GPRS attached in VPLMN(b), attempts to set up a PDP context to *TestServer1*. SCF sends TCAP Abort 10 seconds after PDP context is established. The defaultGPRShandling of MS<sub>7</sub>(a) equals release. If PDP context is **NOT** disconnected the test is passed. In addition the ability to arm the Detection Point pdp-ContextChangeOfPosition is verified.

Message-flow:



Preconditions:	MS <sub>7</sub> (a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state) No valid PDP contexts are established in MS <sub>7</sub> (a). MS <sub>7</sub> (a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).
Action: Service logic:	MS <sub>7</sub> (a) performs "Activate PDP Context Request" to <i>TestAPN10</i> IDPgprs.accessPointName consists of <i>TestAPN10</i> : The SCF alters the APN to be that of Test Server 1 and sends RRgprsE + CONgprs. When ERgprs(PCE-ack) is received SCF waits for 10 seconds and sends TCAP Abort afterwards.
Result:	(i) Successful result if the PDP context is disconnected after 10 ± 2 seconds.
Comments:	(ii) In any other case the test has failed. This test case confirms the correct utilization of the GPRS-CSI parameter defaultGPRShandling=release in case an active PDP context is aborted.

SCF Service Logic



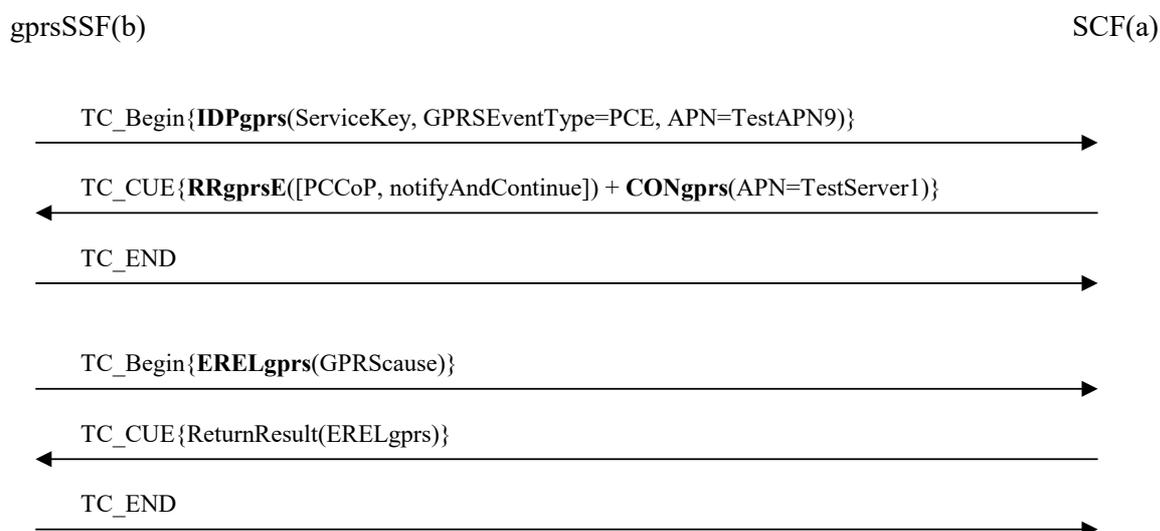
**Figure 69: Abort during active PDP context**

### 2.3.2.5 Check correct operation of EntityReleasedGPRS procedure (Optional)

Overview:

MS<sub>7</sub>(a), GPRS attached in VPLMN(b), sets up a PDP context to *TestAPN9* and is connected to *TestServer1*. After the PDP context is established the tester terminates the session. The operation of the CAP3 information flow EntityReleasedGPRS is verified. If supported, the gprsSCF generates a SM in order to inform the tester about the test result.

Message-flow:



**Preconditions:** MS<sub>7</sub>(a) is GPRS-Attached in VPLMN(b). (MS in STANDBY or READY state)  
 No valid PDP contexts are established in MS<sub>7</sub>(a).  
 MS<sub>7</sub>(a) is connected to a device (e.g. a laptop) providing an application to use the data-transfer-services provided by HPLMN(a) (e.g. WAP,ftp,WWW).

**Action:** MS<sub>7</sub>(a) performs “Activate PDP Context Request” to *TestAPN9*  
 MS<sub>7</sub>(a) actively terminates the PDP context after 10 seconds.

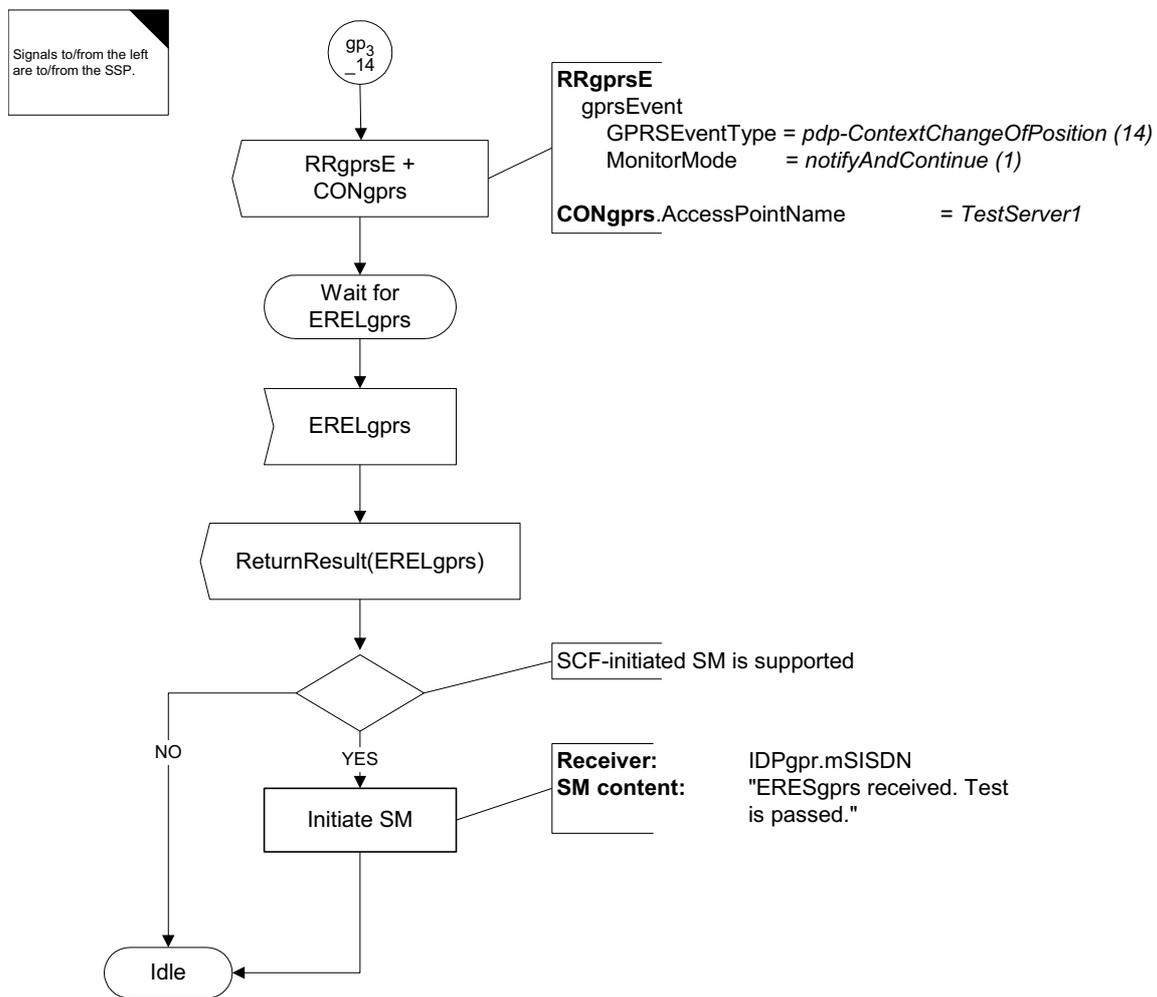
**Service logic:** IDPgprs.accessPointName consists of *TestAPN9*:  
 SCF sends RRgprsE + CUEgprs  
 The SCF waits for ERELgprs(GPRScause).

**Optional:** After reception of ERELgprs(GPRScause) the SCF initiates the transmission of a SM to MS<sub>7</sub>(a) with the following content:  
 “ERELgprs received. Test is passed.”

**Result:** (i) Successful result if gprsSSF has terminated the context by sending EntityReleasedGPRS.

**Comments:** (ii) In any other case the test has failed.  
 This test case confirms the correct operation of ERELgprs information flow. ERELgprs is sent in case a CAMEL3 GPRS monitor relationship exists and the user or SGSN disconnects the PDP context.

### SCF Service Logic



**Figure 70: Check correct operation of EntityReleasedGPRS**

### 2.3.3 Mobility Management

#### General

Mobility management features in CAMEL Phase 3 provide notification service from the VLR to the IN server, based on MAP V3. Following events are used to trigger notification:

- IMSI Attach
- MS initiated IMSI detach (explicit detach)
- Location update in the same VLR service area
- Location update to another VLR service area
- Network initiated IMSI detach (implicit detach).

It is generally understood that the roaming tester is not expected to perform test requiring change of area or wait for a network initiated IMSI detach. Nevertheless, Mobility Management features based on physical mobility are proposed to be tested, on bilateral understanding between HPLMN and VPLMN.

If supported by the gsmSCF, the test result will be sent to the test SIM card using a Short Message.

Camel Phase 3 – Mobility Management service logic

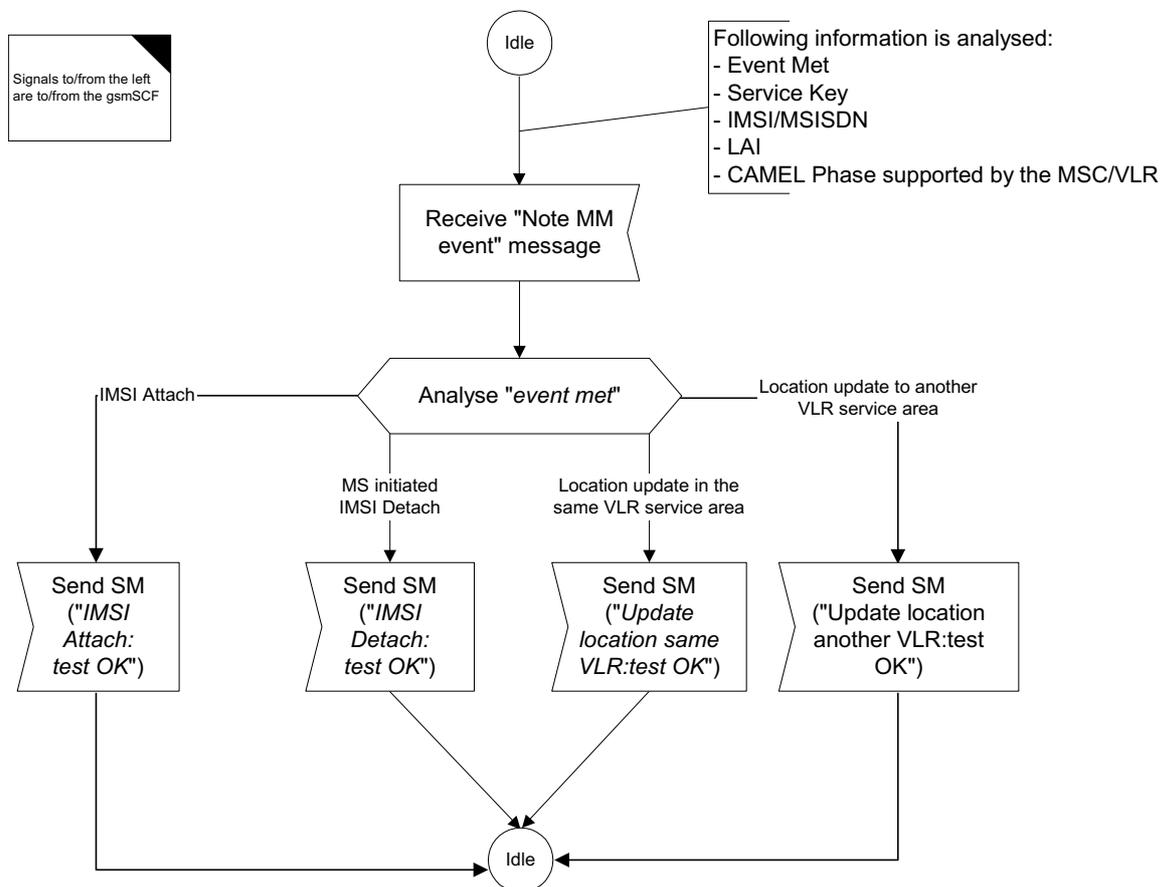


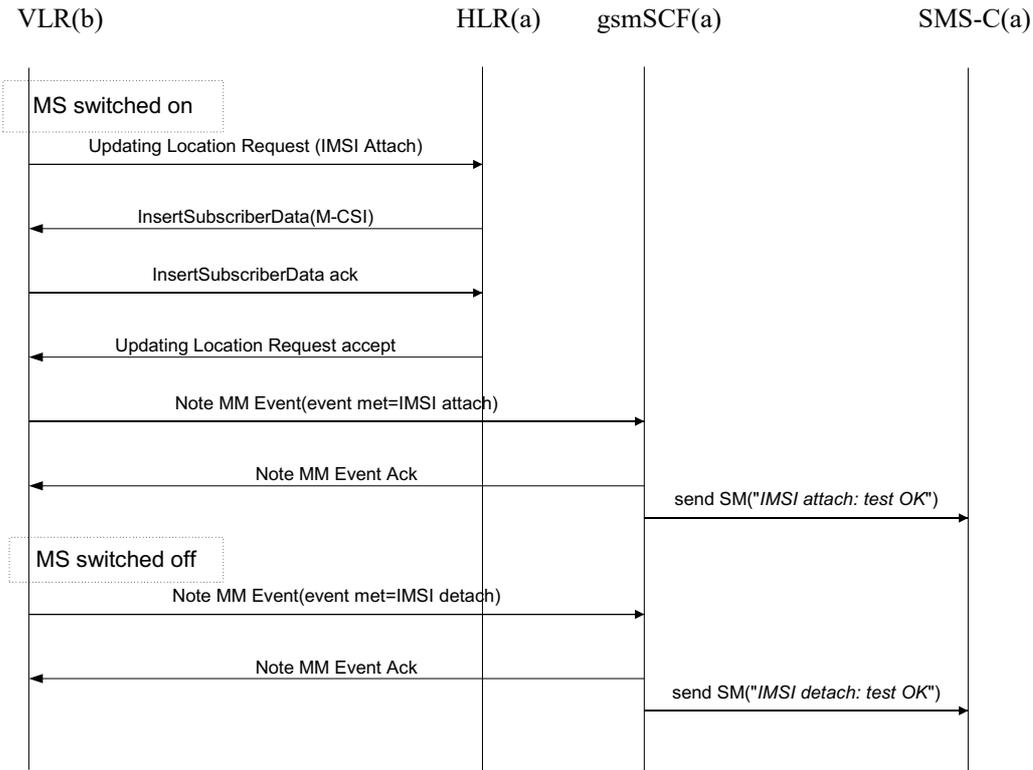
Figure 71: Mobility Management service logic

2.3.3.1 IMSI Attach, IMSI Detach and Location update in the same VLR area with the same LAI

Overview:

MS<sub>7</sub>(a) registers in VPLMN(b). Afterwards the MS is switched off. The presence of subscriber data (M-CSI) in the VLR is verified as well as notification to gsmSCF due to events “IMSI Attach” and “MS initiated IMSI detach”.

Message flow:



**Preconditions:** MS<sub>7</sub>(a) contains SIM of HPLMN(a). HLR record contains M-CSI.

**Action:** Switch on MS<sub>7</sub>(a). Make sure MS is attached to VPLMN(b).  
 Check VLR record for the IMSI/MSISDN of MS<sub>7</sub>(a).  
 Switch off MS<sub>7</sub>(a).  
 Switch on MS<sub>7</sub>(a).

**Service logic:** Optional:  
 gsmSCF on receiving notification for *IMSI Attach* from VLR initiates SM sending procedure to MS<sub>7</sub>(a)  
 gsmSCF on receiving notification for *IMSI Detach* from VLR initiates SM sending procedure to MS<sub>7</sub>(a)

**Result:** Successful result if at least the following entries are included in VLR record:  
 M-CSI  
 MobilityTriggers  
 Location update in the same VLR service area (0)  
 Location update to another VLR service area (1)  
 IMSI attach (2)  
 User initiated IMSI Detach (3)  
 Network initiated IMSI Detach (4)  
 ServiceKey: equal to information provided by HPLMN(a)  
 gsmSCFAddress: equal to information provided by HPLMN(a)

At least the following SMs are received by MS<sub>7</sub>(a):

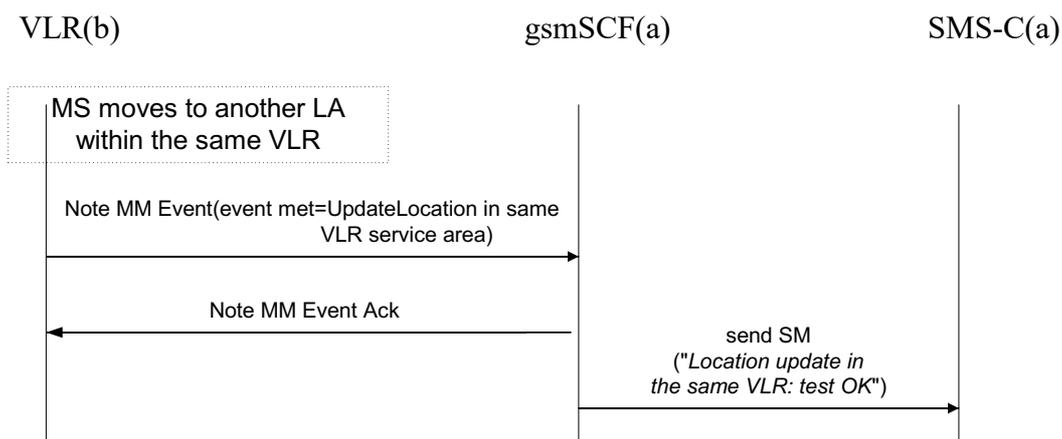
Comments: First SM with the text: "IMSI attach: test OK"  
 Second SM with the text: "IMSI detach: test OK"  
 This test case confirms operation of Insert Subscriber Data procedure including M-CSI.  
 Also tested are notification on *IMSI Attach* and *IMSI Detach* events.  
 Please note that after switching on the MS again, two SMs are received, one for the last IMSI detach and the other for the IMSI attach.

**2.3.3.2 Location update by MS<sub>7</sub>(a) in the same VLR of VPLMN(b) with different LAI (optional)**

Overview:

MS<sub>7</sub>(a) registered in VPLMN(b) moves to another Location Area within the same VLR service area, thus provoking a new update location. Notification to SCP on *update location in the same VLR service area* is verified.

Message flow:



Preconditions: MS<sub>7</sub>(a) contains SIM of HPLMN(a) and is successfully registered in VPLMN(b).  
 Tester is aware of geographical position of neighbouring Location Areas.

Action: MS<sub>7</sub>(a) moves to another Location Area within the same VLR service area.

Service logic: Optional:  
 - on receiving notification for *Update location in the same VLR service area* from VLR the SCP initiates SM sending procedure to MS<sub>7</sub>(a).

Result: Test is passed if the MM notification *Update location in the same VLR service area* is sent to the SCP. Optionally MS<sub>7</sub>(a) receives SM with text : "Update location in the same VLR: test OK"

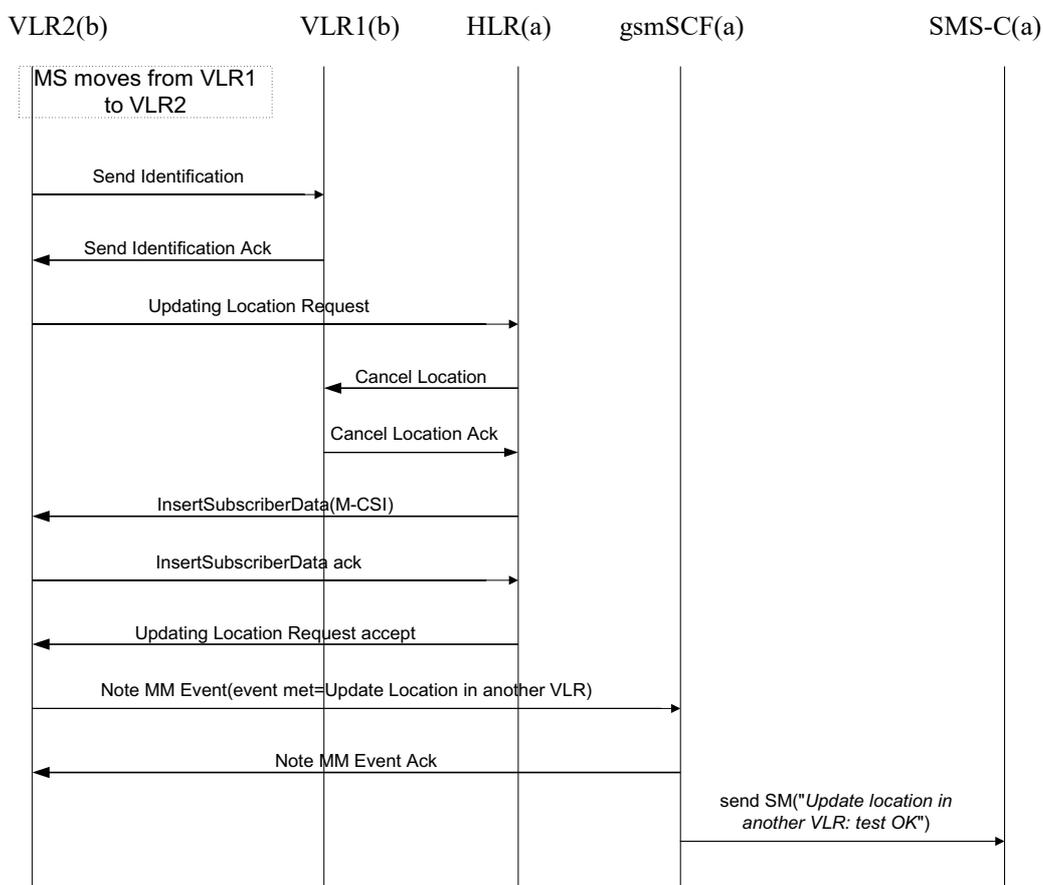
Comments: Note that Mobility Management features based on physical mobility are proposed to be tested on bilateral understanding between HPLMN and VPLMN.

### 2.3.3.3 Location update by MS<sub>7</sub>(a) in another VLR area of VPLMN(b) (optional)

Overview:

MS<sub>7</sub>(a) registered in VPLMN(b) moves towards a new VLR service area. Notification to gsmSCF on *update location in the new VLR service area* is verified.

Message flow



Preconditions:	MS <sub>7</sub> (a) contains SIM of HPLMN(a) and is successfully registered in VPLMN(b) in VLR1(b) service area. Tester is aware of geographical position of neighbouring MSC coverage.
Action:	MS <sub>7</sub> (a) moves to a different VLR(b) service area on VPLMN(b).
Service logic:	Optional: - gsmSCF on receiving notification for <i>Update location in another VLR service area</i> from VLR initiates SM sending procedure to MS <sub>7</sub> (a).
Result:	Test is passed if the MM notification <i>Update location in another VLR service area</i> is sent to gsmSCF. Optionally MS <sub>7</sub> (a) receives SM with text : " <i>Update location in another VLR: test OK</i> "
Comments:	Note that Mobility Management features based on physical mobility are proposed to be tested on bilateral understanding between HPLMN and VPLMN.

### 3 Equipment Requirements

The Equipment described in this section is necessary for undertaking the test cases described in section **Error! Reference source not found.**

#### 3.1 General

It is expected that manual selection will be used to select VPLMN(b) when using the SIM cards supplied by HPLMN(a). To facilitate subsequent automatic selection it is required that bits b6 and b5 of byte 2 of the SIM Service Table (Data-field 38) be set to "1", and the chosen VPLMN is in the PLMN Selector (Data-field 30).

In order to replicate the service that normal roamers will encounter, it is required that any SIM used in the tests shall have one access class out of the classes 0-9 defined. No other access class (e.g. 10 or 11-15) shall be defined.

It is recommended that on any new SIM the Location Update Status field is set to "Status not updated" before the tests start (bit b2 set to "0" and bit b1 set to "1", of byte 11 of Data-field 7E).

The supply of additional SIM cards may be agreed by the HPLMN(a) and VPLMN(b), typically for the purposes of:

- Spare cards in case of failure
- Allocation from different HLRs

#### 3.2 User Equipment for CAMEL phase 1 tests

- Two Mobile Equipment supplied by VPLMN(b)
- Two SIM cards supplied by HPLMN(a) with the following characteristics:
- HLR entry for MS<sub>7</sub>(a) contains at least:
  - Provisioned Teleservices: TS11
  - O-CSI
  - o-BcsmTriggerDetectionPoint = *collectedInfo (2)*
  - serviceKey: Service Key of the originating test service
  - gsmSCF-Address
  - defaultCallHandling = *continueCall*
  - SS : BOICexHC : Provisioned
  - SS : CFNRy : Provisioned
  - HLR entry for MS<sub>2</sub>(a) contains at least:
  - Provisioned Teleservices: TS11

- O-CSI
- o-BcsmTriggerDetectionPoint = *collectedInfo (2)*
- serviceKey: Service Key of the originating test service for CAMEL phase 1
- gsmSCF-Address
- defaultCallHandling = *releaseCall*
- T-CSI
- t-BcsmTriggerDetectionPoint = *terminatingAttemptAuthorised (12)*
- serviceKey: Service Key of the terminating test service of CAMEL phase 1
- gsmSCF-Address
- defaultCallHandling = *releaseCall*
- ODB-BOICexHC : Active

For the service key of the originating and the terminating test service different values have to be chosen. These service keys have to differ from the service keys used for CAMEL phase 2 testing.

One SIM card supplied by VPLMN(b) (MS<sub>3</sub>(b)).

### 3.3 User Equipment for CAMEL phase 2 tests

- Two Mobile Equipment supplied by VPLMN(b)
- Three SIM cards supplied by HPLMN(a) with the following characteristics:
- HLR entry for MS<sub>4</sub>(a) contains at least:
  - Provisioned Teleservices: TS11
  - O-CSI
  - o-BcsmTriggerDetectionPoint = *collectedInfo (2)*
  - serviceKey: Service Key of the originating test service for CAMEL phase 2
  - gsmSCF-Address
  - defaultCallHandling = *releaseCall*
  - camelCapabilityHandling = *CAMEL phase 2 (2)*
  - O-BcsmCamelTDP-CriteriaList
  - matchType = *enabling*
  - destinationNumberLengthList: *4 digits (4)*
  - SS-CSI
  - ssEventList = *MultiPTY*
  - gsmSCF-Address
  - SS : BOICexHC : Provisioned
  - SS : AoCI : Provisioned
  - SS : MultiPTY : Provisioned
- HLR entry for MS<sub>5</sub>(a) contains at least:
  - Provisioned Teleservices: TS11
  - O-CSI
  - o-BcsmTriggerDetectionPoint = *collectedInfo (2)*
  - serviceKey: Service Key of the originating test service for CAMEL phase2
  - gsmSCF-Address
  - defaultCallHandling = *continueCall*
  - camelCapabilityHandling = *CAMEL phase 2 (2)*
  - T-CSI

- t-BcsmTriggerDetectionPoint = terminatingAttemptAuthorised (12)
  - serviceKey: Service Key of the terminating test service
  - gsmSCF-Address
  - defaultCallHandling = *releaseCall*
  - ODB-BOICexHC : Active
  - SS : CFNRy : Provisioned
- HLR entry for MS<sub>6</sub>(a) contains at least:
    - Provisioned Teleservices: TS11
    - O-CSI
    - o-BcsmTriggerDetectionPoint = *collectedInfo* (2)
    - serviceKey: Service Key of the originating test service for CAMEL phase2
    - gsmSCF-Address
    - defaultCallHandling = *releaseCall*
    - camelCapabilityHandling = *CAMEL phase 2* (2)

For the service key of the originating and the terminating test service different values have to be chosen. These service keys have to differ from the service keys used for CAMEL phase 1 testing.

The supply of additional SIM cards may be agreed by the HPLMN(a) and VPLMN(b), typically for the purposes of:

- spare cards in case of failure
- allocation from different HLRs

One SIM card supplied by VPLMN(b) (MS<sub>3</sub>(b)).

### 3.4 User Equipment for CAMEL phase 3 tests

- Two Mobile Equipment supplied by VPLMN(b)
- Two SIM cards supplied by HPLMN(a) with the following characteristics:
- HLR entry for MS<sub>7</sub>(a) contains at least:
  - Provisioned Teleservices: TS11, TS20
  - subscribed APNs:
    - "wild card" or
    - TestAPN1 and
    - TestAPN2 and
    - TestAPN3 and
    - TestAPN4 and
    - TestAPN5 and
    - TestAPN6 and
    - TestAPN9 and
    - TestAPN10 and
    - TestServer1
  - SMS-CSI
  - o-TriggerDetectionPoint = *SMS\_collectedInfo* (2)
  - serviceKey: Service Key of the SMS test service logic for CAMEL Phase 3
  - gsmSCF-Address
  - defaultSMSHandling = *continue*

- GPRS-CSI
  - gprs-CamelTDPDataList
  - GPRS-CamelTDPData
  - gprs-TriggerDetectionPoint = **pdp-ContextEstablishment (11)**
  - serviceKey = equal to info provided by HPLMN(a)
  - gsmSCF-Address = equal to info provided by HPLMN(a)
  - defaultSessionHandling = releaseTransaction (1)
  - GPRS-CamelTDPData
  - gprs-TriggerDetectionPoint = pdp-ContextChangeOfPosition (14)
  - serviceKey = equal to info provided by HPLMN(a)
  - gsmSCF-Address = equal to info provided by HPLMN(a)
  - defaultSessionHandling = continueTransaction (0)
  - camelCapabilityHandling = CAMEL Phase 3 (3)
  - M-CSI
  - MobilityTriggers
  - Location update in the same VLR service area (0)
  - Location update to another VLR service area (1)
  - IMSI attach (2)
  - User initiated IMSI Detach (3)
  - Network initiated IMSI Detach (4)
  - serviceKey: Service Key of the MM test service logic for CAMEL Phase 3
  - gsmSCF-Address
- HLR entry for MS<sub>8</sub>(a) contains at least:
    - Provisioned Teleservices: TS11, TS20
    - Subscribed APNs:
      - "Wild card" or
      - TestAPN7 and
      - TestAPN8 and
      - TestServer1
    - SMS-CSI
    - o-TriggerDetectionPoint = SMS\_collectedInfo (2)
    - serviceKey: Service Key of the SMS test service logic for CAMEL Phase 3
    - gsmSCF-Address
    - defaultSMShHandling = release
    - GPRS-CSI
    - gprs-CamelTDPDataList
    - GPRS-CamelTDPData
    - gprs-TriggerDetectionPoint = **attach (1)**
    - serviceKey = equal to info provided by HPLMN(a)
    - gsmSCF-Address = equal to info provided by HPLMN(a)
    - defaultSessionHandling = continueTransaction (0)
    - GPRS-CamelTDPData
    - gprs-TriggerDetectionPoint = attachChangeOfPosition (2)
    - serviceKey = equal to info provided by HPLMN(a)
    - gsmSCF-Address = equal to info provided by HPLMN(a)
    - defaultSessionHandling = releaseTransaction (1)

- camelCapabilityHandling = CAMEL Phase 3 (3)

The service keys used for SMS originating tests have to differ from the service keys used for the other tests.

One SIM card supplied by VPLMN(b) (MS3(b)).

### 3.5 Test Equipment

The availability of a CCITT # 7 tester able to decode SCCP, TCAP, MAP and CAP is highly advisable. Additionally, it is essential for any analysis of test case failures.

Clock capable of being used to allow testing personnel to record call start and chargeable start (i.e.: answer) time of calls to an accuracy as defined in IREG PRD IR.24. If possible, the clock shall be adjusted to be in alignment with the internal MSC clock which is used for the Toll Ticketing function.

Stopwatch capable of measuring perceived chargeable duration of calls to an accuracy as defined in IREG PRD IR.24.

## 4 Pre-Testing Data Exchange

It is necessary for the two PLMNs to have exchanged the Pre-Testing data defined in this section prior to the commencement of testing.

### 4.1 Testing Contact Information

The following information should be exchanged by both PLMNs:

Test co-ordination contact names, telephone numbers, fax numbers and e-mail addresses.

### 4.2 PLMN addressing, numbering and routing data

Confirmation of the PLMN addressing numbering and routing data as referenced in the Stage 3 [IREG PRD IR23], is regarded as advisable. Such information includes:

- E212-E214 translation
- MSC/VLR and HLR E164 addresses
- MSRN number ranges
- International Signalling Point Codes (if applicable)

These data are provided by IREG PRD IR21.

Additionally, the exchange of SCP-GT ranges is regarded as advisable.

### 4.3 SIM associated data

The following information as stored in the SIM and/or HLR is required individually for each of the SIM cards:

- N, PUK/(SUPER PIN).
- IMSI
- MSISDN
- Basic Service Subscription Information
- Initial Supplementary Service Configuration Information

O/T-CAMEL Subscription Information (triggerDetectionPoint, serviceKey, gsmSCF-Address and defaultCallHandling)

#### 4.4 Test Service associated data

The following information is required:

The destination numbers of the Test Announcements: AAC1, AAC2, AAC3, AAC4 and AAC5

The service keys used for the originating and the terminating test service for CAMEL phase 1 and 2

	CAMEL phase 1	CAMEL phase 2	CAMEL phase 3
Originating test service logic	ServiceKey1	ServiceKey3	ServiceKey5
Terminating test service logic	ServiceKey2	ServiceKey4	ServiceKey6
SMS test service logic			ServiceKey7
MM test service logic			ServiceKey8

The GT of the SCP used for testing

Additionally required information for CAMEL Phase 3 tests:

SMSC Address of HPLMN

SCF-initiated SM is used to indicate the test-result if required in test-case  
[Yes/No].....

**Note:** The Test Numbers – *TestNbr1*, *TestNbr2*, ... – are predefined numbers specified in the Annex.

## Annex A

### A.1 Protocol informationW flows and features reference list

Protocol Information flows in CAMEL (ASEs)

			CAMEL phase 1		CAMEL phase 2		CAMEL phase 3	
			applicability	testcase	applicability	testcase	applicability	testcase
1	InitialDP	gsmSSF →gsmSCF	X	2.1.2	X	2.2.2.1	X	Not tested
2	AssistRequestInstructions	gsmSRF →gsmSCF			X	used	X	not tested
3	establishTemporaryConnection	gsmSCF→ gsmSSF			X	0	X	not tested
4	disconnectForwardConnection	gsmSCF→ gsmSSF			X	0	X	not tested
5	connectToResource	gsmSCF→ gsmSSF			X	used	X	not tested
6	connect	gsmSCF→ gsmSSF	X	2.1.2	X	2.2.2.1	X	not tested
7	releaseCall	gsmSCF→ gsmSSF	X	2.1.4	X	0	X	not tested
8	eventReportBCSM	gsmSSF →gsmSCF	X	2.1.4	X	0	X	not tested
9	requestReportBCSMEvent	gsmSCF→ gsmSSF	X	2.1.4	X	0	X	not tested
10	eventNotificationCharging							
11	requestNotificationChargingEvent							
12	collectInformation							
13	continue	gsmSCF→ gsmSSF	X	2.1.5	X	0	X	not tested
14	initiateCallAttempt							
15	resetTimer	gsmSCF→ gsmSSF			X	not tested	X	not tested
16	furnishChargingInformation	gsmSCF→ gsmSSF			X	0	X	not tested
17	applyChargingReport	gsmSSF →gsmSCF			X	2.2.6	X	not tested
18	applyCharging	gsmSCF→ gsmSSF			X	2.2.6	X	not tested

19	callGap	gsmSCF→ gsmSSF					X	not tested
20	serviceFilteringResponse							
21	activateServiceFiltering							
22	callInformationReport	gsmSSF →gsmSCF			X	2.2.6	X	not tested
23	callInformationRequest	gsmSCF→ gsmSSF			X	2.2.6	X	not tested
24	sendChargingInformation	gsmSCF→ gsmSSF			X	2.2.6	X	not tested
25	specializedResourceReport	gsmSRF □gsmSCF	–		X	used	X	not tested
26	playAnnouncement	gsmSCF→ gsmSRF			X	used	X	not tested
27	promptAndCollectUserInformation	gsmSCF→ gsmSRF			X	not tested	X	not tested
28	cancel	gsmSCF→ gsmSSF			X	not tested	X	not tested
29	activityTest	gsmSCF→ gsmSSF	X	not tested	X	not tested	X	not tested
30	continueWithArgument	gsmSCF→ gsmSSF					X	not tested
GPRS CAP operation								
1	ApplyChargingReportGPRS	gprsSSF →gsmSCF					X	2.3.2.2.x
2	EventReportGPRS	gprsSSF →gsmSCF					X	2.3.2.2.1
3	InitialDPGPRS	gprsSSF →gsmSCF					X	2.3.2.2.1
4	gGPRS	gsmSCF→ gprsSSF					X	2.3.2.2.x
5		gsmSCF→ gprsSSF					X	not tested
6	S	gsmSCF→ gprsSSF					X	2.3.2.2.1
7	RS	gsmSCF→ gprsSSF					X	2.3.2.2.1
8	ngInformationGPRS	gsmSCF→ gprsSSF					X	2.3.2.2.1
9	S	gsmSCF→ gprsSSF					X	2.3.2.2.1

10	requestReportGPRSEvent	gsmSCF→ gprsSSF					X	2.3.2.2.1
11	resetTimerGPRS	gsmSCF→ gprsSSF					X	not tested
12	activityTestGPRS	gsmSCF→ gprsSSF					X	not tested
13	entityReleasedGPRS	gprsSSF →gsmSCF					X	Figure 69
14	sendChargingInformationGPRS	gsmSCF→ gprsSSF					X	not tested
SMS CAP operation								
1	SMS	gprsSSF →gsmSCF  gsmSSF →gsmSCF					X	2.3.1.5
2	initialDPMSMS	gprsSSF →gsmSCF  gsmSSF →gsmSCF					X	2.3.1.2
3	S	gsmSCF→ gprsSSF  gsmSCF→ gsmSSF					X	2.3.1.2
4	S	gsmSCF→ gprsSSF  gsmSCF→ gsmSSF					X	2.3.1.5
5	gingInformationSMS	gsmSCF→ gprsSSF  gsmSCF→ gsmSSF					X	not tested
6	S	gsmSCF→ gprsSSF  gsmSCF→ gsmSSF					X	2.3.1.3
7	prtSMSEvent	gsmSCF→ gprsSSF  gsmSCF→ gsmSSF					X	2.3.1.5

8	ResetTimerSMS	gsmSCF→ gprsSSF gsmSCF→ gsmSSF					X	not tested
GSM MAP operation								
1	AnyTimeInterrogation	gsmSCF→ HLR	X	used	X	used	X	not tested
2	ProvideSubscriberInformation	HLR→ VLR	X	2.1.3	X	0	X	not tested
3	Unstructured SS Request	gsmSCF→ HLR			X	not tested	X	not tested
4	Unstructured SS Notify	gsmSCF→ HLR			X	not tested	X	not tested
5	Process Unstructured SS Data	HLR→ gsmSCF			X	not tested	X	not tested
6	processUnstructuredSS-Request	HLR→ gsmSCF			X	not tested	X	not tested
7	SSinvocationNotification	MSC→ gsmSCF HLR→ gsmSCF (Ph3)			X	2.2.10 .1	X	not tested
8	BeginSubscriberActivity	HLR→ gsmSCF			X		X	not tested
Mobility Management MAP operation								
1	MobilityManagementEventNotification	VLR→ gsmSCF					X	2.3.3.1
Control of subscription Data								
1	AnyTimeSubscriptionInterrogation	gsmSCF→ HLR					X	not tested
2	AnyTimeModification	gsmSCF→ HLR					X	not tested
3	NotifySubscriberDataChange	HLR→ gsmSCF					X	not tested

**Note:** “used” means, that the information flow is used inside HPLMN(a) during execution of a test case but is not tested across the international interface.

## A.2 Overview of CAMEL phase 1 Features

	CAMEL phase 1	Test case	Comments
Trigger Detection points:	2		T-CSI triggering is only tested in connection with suppression of announcement. Further scenarios are not relevant in the roaming environment as long as optimal routing is not supported.
Subscriber information	O-CSI, T-CSI	2.1.2	
Trigger criteria	One CSE per CSI		
Call related Detection Points	MO: 3 MT: 3 + Collected_Info + O_Answer + O_Disconnect + Terminating_Attempt_Authorised + T_Answer + T_Disconnect	2.1.2, 2.1.4 2.1.4 Not tested Not tested Not tested	Only arming, not encountering of EDP9 is tested. DPs in T-BCSM are not tested (see comment above).
Call unrelated CSE interaction	+ Any time interrogation + Reporting of Geographical data + Reporting of Subscriber state (idle, busy, Nreach)	Not tested 2.1.3 2.1.3	The existence of location Information is tested. Reporting of Subscriber state is tested exemplary for camelBusy.
Call related CSE interaction	+ Call Set-up + Suppression of Announcements and tones for MT calls +Support of CalledPartyBCD number +Geographical data	2.1.2 2.1.7 2.1.2 2.1.3	See comment above
Charging Features	+Call reference number	2.1.2	
Interworking with other GSM services	+ Support of CLIP for SPNP	Not tested	

### A.3 Overview of CAMEL phase 2 Features

	CAMEL phase 2	Test case	Comments
Trigger Detection points:	2		
Subscriber information	+U-CSI, UG-CSI +SS-CSI +TIF-CSI	Not tested 2.2.10.1 not tested	
Trigger criteria	+Trigger criteria MO (dialled number, basic service group, call forwarded) and MT (Basic service group)	0, 2.2.10.2 MT not tested	Trigger on length of dialled number is tested Trigger criteria for MTC are not relevant in the roaming environment as long as optimal routing is not supported
Call related Detection Points	MO: 7 MT: 6 +Calling party abandon +no answer +busy.not reachable +busy.busy +routeSelectFailure	Not tested 2.2.5.1 2.2.5.3 2.2.5.2 0	
Call unrelated Detection Points	-	Not tested	
Specialized Resources	+ some Assist procedures: Access to SRFs on another entity (e.g. in HPLMN), Access to facilities on another SSP	0	CAP-ETC and CAP-CTR tested
	+ support of Special Resource Function: Announcement insertion and in-band audio signal injection, optionally via another SSP, HPLMN controlled announcements	Used / not tested	CAP-Cancel, CAP-ResetTimer, CAP-PromptAndCollectUserInfo: <b>not tested</b> CAP-ConnectToResource, CAP-PlayAnnouncement and CAP-SpecializedResourceReport: <b>used</b>
Fraud control	+ SS Invocation notification (MPTY, ECT, CD): Monitoring of subscriber initiation.	2.2.10.1	MPTY notification tested

	CAMEL phase 2	Test case	Comments
Call unrelated CSE interaction	+ Support of USSD communication between MS and gsmSCF. +Cell Id in geographical data: Gives VLR the option to return a stored cell ID in response to a request for location information.	Not tested  Not tested	Not in scope of this test specification
Call related CSE interaction	+ Follow-on call + Support of alerting categories downloaded from SCF: SSF relays the alerting pattern from the CSE to the HLR	0 Not tested	
Charging Features	+ Support of online charging using AoC for Mobile originated calls. + Inclusion of free format information received from the CSE into CAMEL specific charging records. + Support of additional call related information sent to the gsmSCF + Application of charge limits by downloading of maximum call duration timers, tariff switch timers to MSC. Playing of tone 30s before call duration expiry. Provision of precise timestamps and timezone information.	2.2.6  0  2.2.6  2.2.6  0	CAP-SCI tested  CAP-FCI tested  CAP-CIReq/-CIRep tested  CAP-AC/-ACR tested  CAP-IDP parameter tested
Interworking with other GSM services	+ Support for forwarded-to-numbers in SPNP or other short number format by CAMEL supporting VLRs. (TIF-CSI)	Not tested	Not in scope of this test specification
CAMEL handling capability	+ VLR indication of supported CAMEL capability	2.2.1	

## Overview of CAMEL phase 3 Features (in addition to CAMEL phase 2)

	CAMEL phase 3	Test case	Comments
Trigger Detection points:	+4,12,13,14		
Subscriber information	+GPRS-CSI, +SMS-CSI +M-SCI,  +D-CSI, N-CSI +VT-CSI	2.3.2.1 0 2.3.3.1  Not tested Not tested	Subscribed dialled Services CSI & Network dialled Services CSI
Fraud control enhancement	+ SS Invocation notification for CCBS	Not tested	
CSE Control of subscription data	+ control of Subscription data at HLR: - CF-SS, CB-SS, ODB SS data; CSI-data	Not tested	Not tested because the related operations are assumed to be used by a HPLMN internal interface
CSE Notification of change of subscription data	+ notification of change of subscription data - CF-SS, CB-SS, ODB SS data; CSI-data	Not tested	
Support of GPRS (terminal initiated)	+ GPRS attach trigger + PDP context establishment and PDP context establishment acknowledgement triggers + Change of position trigger + Change of QoS, Position EventReport + Time & Volume based Charging per PDP + Time based Charging per session + Inclusion of FreeFormat data in CDR + Support of AoC for GPRS  + GPRS default handling	2.3.2.3.12. 3.2.2.1  Used Not tested 2.3.2.2.1 2.3.2.3.1 2.3.2.2.1 Not tested  2.3.2.3.22. 3.2.4.x	CAMEL support is there, but AoC for GPRS is not currently defined
Support of SMS_MO	+ Control of SMS-MO (CS/PS)	2.3.1.x.y Not tested	

	<b>CAMEL phase 3</b>	<b>Test case</b>	<b>Comments</b>
	+ SMS Charging operations incl. Free-format data in CDR		
Enhancements to circuit switched call control	+ CUE with argument + AoC for MT + DPs in VMSC, V_T-CSI + Support of Localised Service Area + Support of Optimal Routing + DP in VMSC + Control of invocation of Supplementary Services (using SII2 parameter)	Not tested Not tested Not tested Not tested Not tested Not tested Not tested	
Support of Mobility Management	Mobility management event notifications (CS/PS) 1. + Location area update/MS Attach + MS/network-initiated detach + Routeing area update /MS Attach	2.3.3.x	
Dialled service triggers	+ Network dialled Service Triggers + Subscribed dialled Service Triggers	Not tested	
CSE Load Control	+ Call Gapping (HPLMN only)	Not tested	

## A.4 Test Announcements

The structure of the test announcements is detailed below:

- Start announcement after traffic channel is connected (ISUP-ANM(charge))
- After one second send two DTMF tones (announcement ratio for automatic testing)
- Start spoken text in English language
- Repeat text (see table below)
- Disconnect call (ISUP-REL(Cause: normalCallClearing))

Ann. Number	DTMF tones	Text of announcement	Duration	Dialled in test case
1	01	"Test is passed"	Repeat for at least two times	2.1.6.1
2	02	"Test is failed"	Repeat for at least two times	2.1.6.2, 2.2.8.2
3	03	"Test is proceeding"	Repeat for a minimum duration of 1 minute	2.1.8.1 (CF-Number)
4	04	"Test is passed"	Repeat for at least two times	2.2.2.2
5	05	"Test is proceeding. The announcement will be disconnected after 30 seconds."	Repeat for a duration of <b>exactly</b> 30 seconds	-- (Not dialled)

## A.5 Test Numbers

Name	Digits	Used in test case
TestNbr1	5001*456#789	2.1.2
TestNbr2	5002	2.1.4
TestNbr3	0503	2.1.8.2, 2.1.8.3
TestNbr4	5004	2.2.2.1
TestNbr5	5005	2.2.6.1
TestNbr6	5006	2.2.6.3
TestNbr7	5007	2.2.6.2
TestNbr8	0508	0
TestNbr9	0509	2.2.10.3, 2.2.10.4
TestNbr10	5010	0
TestNbr11	5011*456#789	0
TestNbr12	5012	2.2.10.1
TestNbr13	5013	2.2.10.1

TestNbr14	5014	2.3.1.2
TestNbr15	5015	2.3.1.2
TestNbr16	5016	2.3.1.6

## A.6 Test APNs

Name	APN	Used in test case
TestAPN1	ireg.test-APN.1	2.3.2.2.1
TestAPN2	ireg.test-APN.2	2.3.2.2.2
TestAPN3	ireg.test-APN.3	2.3.2.2.3
TestAPN4	ireg.test-APN.4	2.3.2.2.4
TestAPN5	ireg.test-APN.5	2.3.2.2.5
TestAPN6	ireg.test-APN.6	2.3.2.2.5
TestAPN7	ireg.test-APN.7	2.3.2.3.1
TestAPN8	ireg.test-APN.8	2.3.2.3.1
TestAPN9	ireg.test-APN.9	Figure 69
TestAPN10	ireg.test-APN.10	2.3.2.4.2

## Annex B Document Management

### B.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
0.0.1	15.07.1999	IREG Doc 10/99 with changes according to 1 <sup>st</sup> Meeting of IREG CAMEL	IREG	
0.0.3	05.08.1999	Changes according to 2 <sup>nd</sup> Meeting of IREG CAMEL-WP	IREG	
0.0.4	06.09.1999	Pre-Final Version; Input for IREG #37.	IREG	
3.0.0	21.09.1999	Final Version for approval	IREG	
3.0.1	12.01.2000	Changes according to 3 <sup>rd</sup> Meeting of IREG CAMEL-WP	IREG	
3.0.2	31.01.2000	Changes according to 5 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.0.3	13.03.2000	Changes according to email discussions since the 5 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.1.0	14.03.2000	Changes according to 6 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.1.1	06.02.2001	Clarification in test case 2.1.5 Corrections to test case 2.2.4 and according change in Appendix B 2.2.4 Corrections to test case 2.2.7 Correction in chapter 3.1 Corrections to appendix B 2.1.4 Corrections to appendix B 2.1.5 Corrections to appendix B 2.1.8.1	IREG	
3.2.0	21.10.2001	Changes according to 8 <sup>th</sup> and 9 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.3.0	31.01.2003	Test cases 2.1.6.1, 2.1.6.2, 2.2.8.1 and 2.2.8.2: In case SCP does not allow sending no answer to IDP an Abort message should be sent. Chapter 2.3 "Camel Phase 3" included Changes included Chapter 3.4 "User Equipment for CAMEL phase 3 tests" included Annex A.1 enhanced with CAMEL Ph3 information Annex A.3 included	IREG	
3.3.1	22.05.2003	Test-sheets for CAMEL Ph3 added	IREG	
3.3.2	20/10/2004	Corrections to test case 2.2.6.3	IREG	
3.3.3	13/10/2005	Corrections to test case 2.2.6.1 Corrections to test case 2.2.6.3	IREG	

It is our intention to provide a quality product for your use. If you find any errors or omissions, please contact us with your comments. You may notify us at [prd@gsma.com](mailto:prd@gsma.com)

Your comments or suggestions & questions are always welcome.



# End-to-End Functional Capability Specification for Inter- PLMN CAMEL-Roaming (CAMEL Phase 1, Phase 2 and Phase 3)

## Part 2: Test Sheets

Version 3.3.3

13<sup>th</sup> October 2005

*This is a Non-binding Permanent Reference Document of the GSMA*

---

### Security Classification: Non Confidential

Access to and distribution of this document is restricted to the persons permitted by the security classification. This document is confidential to the Association and is subject to copyright protection. This document is to be used only for the purposes for which it has been supplied and information contained in it must not be disclosed or in any other way made available, in whole or in part, to persons other than those permitted under the security classification without the prior written approval of the Association.

### Copyright Notice

Copyright © 2023 GSM Association

### Disclaimer

The GSM Association ("Association") makes no representation, warranty or undertaking (express or implied) with respect to and does not accept any responsibility for, and hereby disclaims liability for the accuracy or completeness or timeliness of the information contained in this document. The information contained in this document may be subject to change without prior notice.

### Antitrust Notice

The information contain herein is in full compliance with the GSM Association's antitrust compliance policy.

## Table of Contents

<b>Appendix B1</b>	<b>4</b>
B.1.1 Network Operator Information	4
B 2.1 Test Results	6
B 2.1.1 Location Update in VPLMN(b)	6
B 2.1.2 Check operation of IDP and CON	10
B 2.1.3 Check operation of PSI	11
B 2.1.4 Check reporting of EDP O_Answer and operation of RC	12
B 2.1.5 Check operation of CUE	13
B 2.1.6 Check Default Call Handling	14
B 2.1.7 Check Suppression of Announcement	16
B 2.1.8 Interaction with GSM Supplementary Services and ODB	17
<b>Appendix B2</b>	<b>21</b>
B.2.1 Network Operator Information	21
B 2.2 Test Results	22
B 2.2.1 Location Update	22
B 2.2.2 Check Operation of IDP and DP2 Criteria	25
B 2.2.3 Check operation of PSI	27
B 2.2.4 Check reporting of EDP O_Answer, O_Disconnect and operation of RC	28
B 2.2.5 Check operation of CUE and FCI with Follow-On Call	29
B 2.2.6 Check operation of CIReq, SCI and AC	33
B 2.2.7 Check operation of ETC and DFC	36
B 2.2.8 Check Default Call Handling	37
B 2.2.9 Check Suppression of Announcement	39
B 2.2.10 Interaction with GSM Supplementary Services and ODB	40
<b>Appendix B3</b>	<b>45</b>
B.3.1 Network Operator Information	45
B 2.3 Test Results	46
B 2.3.3 Mobility Management	69
<b>APPENDIX C1</b>	<b>73</b>
<b>APPENDIX C2</b>	<b>74</b>
<b>APPENDIX C3</b>	<b>76</b>
<b>Annex A Document Management</b>	<b>78</b>
A.1 Document History	78

**Note:** IR.32 version 3.3.3 consists of the following two parts:

- Part 1: test specification
- Part 2: test sheets

This is Part 2.

## Appendix B1

### ***IREG Stage 4 Test Results for Mobile Stations of PLMN(a) Roaming to PLMN(b) when using End-to-End Functional Capability Specification for inter-PLMN CAMEL-Roaming (CAMEL phase 1)***

#### **B.1.1 Network Operator Information**

HPLMN (a).....

VPLMN (b) .....

Date of Tests .....

Testing personnel PLMN (b) .....

Tel/Fax: .....

SCP Manufacturer(s).....

SCP Software Build Level(s) .....

SCP Global Title(s) .....

Version of test application.....

HLR Manufacturer(s) .....

HLR Software Build Level(s) .....

HLR Global Title(s) .....

SMSC Manufacturer(s) .....

SMSC Software Build Level(s) .....

SMSC Global Title(s) .....

VMSC/VLR Manufacturer(s) .....

VMSC/VLR Software Build Level(s) .....

VMSC/VLR Global Title(s) .....

SSP Manufacturer(s) .....

SSP Software Build Level(s) .....

SSP Global Title(s) .....

TAP records resulting from the tests will be produced and transferred to the HPLMN [✓=Yes/X=No].....

Comments:

## B 2.1 Test Results

The numbering of the test result sections within this appendix is identical to the associated Test case from section 2 of the main document.

### B 2.1.1 Location Update in VPLMN(b)

Perform Location Update for MS<sub>1</sub>(a) and MS<sub>2</sub>(a)

#### B 2.1.1.1 Location Update by MS<sub>1</sub>(a) in VPLMN(b)

- (a) VLR Record contents:
- MSISDN of MS<sub>1</sub>(a) .....
  - IMSI of MS<sub>1</sub>(a) .....
  - Teleservices **Speech (required)** [✓=Yes/X=No].....
  - SMS MO [✓/X]..... SMS MT [✓/X].....
  - Fax[✓/X].....
  - Supplementary Services
  - BAOC [✓/X].....
  - BOIC [✓/X].....
  - BOIC exHC (required)[✓/X].....
  - CFB [✓/X].....C Number.....
  - CFNRy (required) [✓/X].....C Number.....
  - CFNRc [✓/X].....C Number.....
  - CW [✓/X].....
  - CH [✓/X].....
  - MPTY [✓/X].....
  - O-CSI (required)
    - TriggerDetectionPoint: .....
    - ServiceKey: ..... equal to information provided by  
HPLMN(a): [Yes/No] .....
    - GsmSCFAddress..... equal to information provided by  
HPLMN(a): [Yes/No] .....
    - DefaultCallHandling equal to **continueCall** [Yes/No] .....
  - Others .....
- (b) Comments
- (c) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....

Time.....

Date.....

**B 2.1.1.2. Location Update by MS<sub>2</sub>(a) in VPLMN(b)**

(a) VLR Record contents:

MSISDN of MS<sub>2</sub>(a) .....

IMSI of MS<sub>2</sub>(a) .....

Teleservices **Speech (required)** [✓=Yes/X=No].....

SMS MO [✓/X]..... SMS MT [✓/X].....

Fax[✓/X].....

Supplementary Services

BAOC [✓/X].....

BOIC [✓/X].....

BOIC exHC [✓/X].....

CFB [✓/X].....C Number.....

CFNRy [✓/X].....C Number.....

CFNRc [✓/X].....C Number.....

CW [✓/X].....

CH [✓/X].....

MPTY [✓/X].....

Operator Determined Barring:

ODB-BOICexHC is ACTIVE (required) [Yes/No] .....

O-CSI (required)

TriggerDetectionPoint: .....

ServiceKey: ..... equal to information provided by  
HPLMN(a): [Yes/No] .....

GsmSCFAddress..... equal to information provided by  
HPLMN(a): [Yes/No] .....

DefaultCallHandling equal to release**Call** [Yes/No] .....

Others .....

(b) Comments

(c) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....

Time.....

Date.....

### B 2.1.2 Check operation of IDP and CON

MS<sub>1</sub>(a) calls TestNbr1.

- (a) MSISDN of originating MS (that is, MS<sub>1</sub>(a)) .....
- (b) Number keyed into MS<sub>1</sub>(a).... **5001\*456#789** .....
- (c) Time of start of call (i.e. SEND key operation) .....hr .....min .....sec
- (d) Delay between SEND key operation at MS<sub>1</sub>(a) and announcement start ..... sec
- (e) Time of perceived answer of call (announcement).... hr... .min .....sec
- (f) Chargeable Call Duration (i.e. duration listening to the announcement) ..... sec
- (g) Test results:
  - Announcement "Test is passed" was successfully played [/X].....  
(Which means test is PASSED)
  - Announcement "Test is failed" was successfully played [/X].....  
(Which means test is FAILED)
  - No announcement is played [/X] .....  
(Which means test is FAILED)
- (h) Comments
  
  
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

### B 2.1.3 Check operation of PSI

MS<sub>1</sub>(a) calls MS<sub>2</sub>(a) while MS<sub>2</sub>(a) is busy.

- (a) MSISDN of MS<sub>1</sub>(a) .....
- (b) MSISDN of called telephone MS<sub>2</sub>(a).....
- (c) Party with which MS<sub>2</sub>(a) is in conversation [DN] .....
- (d) Time of start of call .....hr.....min.....sec
- (e) Time of perceived answer of call .....hr.....min.....sec

Duration of the announcement .....sec

- (f) Test results:  
Announcement "Test is passed" was successfully played [✓/X].....  
(Which means test is PASSED)  
Any other announcement [✓/X].....  
(Which means test is FAILED)  
Busy Tone is reached [✓/X] .....  
(Which means test is FAILED)

(g) Comments

(h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

### B 2.1.4 Check reporting of EDP O\_Answer and operation of RC

MS<sub>1</sub>(a) calls TestNbr2 and reaches Announcement 3, which is listened by the calling party during 10 seconds.

- (a) Directory Number of calling telephone MS<sub>1</sub>(a) .....
- (b) Number dialled (TestNbr2) ..... **5002** .....
- (c) Time of start of call (i.e. last digit dialled) .....hr .....min .....sec
- (d) Time of start of "Test is proceeding" announcement.....hr.....min.....sec
- (e) Duration of the announcement.....sec
- (f) Test results:  
Announcement "Test is proceeding" was successfully played and was released after 10 ±1 seconds by the SCP [✓/X].....  
(Which means test is PASSED)  
Announcement "Test is proceeding" was successfully played and was NOT disconnected after 10 ±1 seconds by the SCP [✓/X].....  
(Which means test is FAILED)
- (g) Comments
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.1.5 Check operation of CUE**

MS<sub>1</sub>(a) calls MS<sub>3</sub>(b) both roaming in VPLMN(b). MS<sub>3</sub>(b) accepts the call and the call is established. Later MS<sub>3</sub>(b) disconnects the call.

- (a) MSISDN of originating MS (that is, MS<sub>1</sub>(a)) .....
- (b) Number keyed into MS<sub>1</sub>(a) .....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Delay between SEND key operation at MS<sub>1</sub>(a) and MS<sub>3</sub>(b) alerting .... sec
- (e) Time of perceived answer of call ..... hr ..... min ..... sec
- (f) Chargeable Call Duration (i.e. perceived answer until end of call)..... sec
- (g) Test Result:  
 Call is established to MS<sub>3</sub>(b) [✓/X].....  
       (Which means test is PASSED)  
 Any other case [✓/X].....  
       (Which means test is FAILED)
- (h) Comments
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

## B 2.1.6 Check Default Call Handling

### B 2.1.6.1 defaultCallHandling set to continueCall

MS<sub>1</sub>(a) dials Test Announcement 1 (“Test is Passed”), and the call is connected. Number to be dialled in international format (that is, starting with “+”).

- (a) MSISDN of MS<sub>1</sub>(a).....
- (b) Dialled Number (Test Announcement 1) .....
- (c) Time of start of call (i.e. SEND key operation) .....hr.....min.....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (e) Chargeable Call Duration (that is, perceived answer until end of call) .....sec
- (f) Test results:  
 Announcement “Test is Passed” was successfully played [✓/X].....  
 (Which means test is PASSED)  
 Any other case [✓/X].....  
 (Which means test is FAILED)
- (g) Comments
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.1.6.2 defaultCallHandling set to releaseCall**

MS<sub>2</sub>(a) dials Test Announcement 2 (“Test is Failed”), and the call is released (**NOT connected**). Number to be dialled in international format (that is, starting with “+”).

(a) MSISDN of MS<sub>2</sub>(a).....

(b) Dialled Number (Test Announcement 2).....

(c) Test Result:

Call released [✓/X].....

(Which means test is PASSED)

Call connected to “test failed” announcement [✓/X].....

(Which means test is FAILED)

(d) Comments

(e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.1.7 Check Suppression of Announcement**

MS<sub>2</sub>(a) and MS<sub>3</sub>(b) have location updated successfully in VPLMN(b). MS<sub>2</sub>(a) removes the battery. MS<sub>3</sub>(b) calls MS<sub>2</sub>(a).

(a) MSISDN of MS<sub>3</sub>(b) .....

(b) MSISDN of MS<sub>2</sub>(a) .....

(c) Test Results:

No announcement or HPLMN(a) announcement is played to calling party  
[✓/X].....

(Which means test is PASSED)

VPLMN announcement is played [✓/X].....

(Which means test is FAILED)

(d) The outcome of the test case is only reliable in case PLMN(b) plays an announcement on no paging response while SoA is not invoked.

PLMN(b) supports an announcement on no paging response [✓=Yes/X=No].....

(d) Comments

(e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.1.8 Interaction with GSM Supplementary Services and ODB****B 2.1.8.1 Call Forwarding on no reply (CFNRy)**

MS<sub>3</sub>(b) calls MS<sub>1</sub>(a), which has activated Call Forwarding on No Reply to Test Announcement 3.

- (a) MSISDN of MS<sub>1</sub>(a) .....
- (b) MSISDN of calling MS<sub>3</sub>(b) .....
- (c) DN of forwarded - to – Test Announcement 3 .....
- (d) Time of start of call .....hr.....min....sec
- (e) Delay between dialling last digit of MSISDN of MS<sub>1</sub>(a) at MS<sub>3</sub>(b) and MS<sub>1</sub>(a) ringing .....sec
- (f) Length of time for which MS(a<sub>1</sub>) "rings" .....sec
- (g) Time of perceived announcement start .....hr.....min.....sec
- (h) Chargeable Call Duration (i.e. duration of announcement) ..... sec
- (i) Test results:  
 Announcement "Test is Passed" was successfully played [✓/X].....  
 (Which means test is PASSED)  
 Announcement "Test is Failed", any other announcement or no announcement is played [✓/X].....  
 (Which means test is FAILED)
- (j) Comments

(k) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.1.8.2 Barring of outgoing international calls except to HPLMN country (BOICexHC)**

MS<sub>1</sub>(a) activates BOICexHC and attempts a call to TestNbr3.

(a) MSISDN of MS<sub>1</sub>(a) .....

(b) TestNbr3 number keyed ..... **0503** .....

(c) Test results:

Call attempt fails and no announcement is played to calling party [/X].....

(Which means test is PASSED)

VPLMN (b) barring announcement played [/X].....

(Which means test is PASSED)

Call is successful [/X].....

(Which means test is FAILED)

(d) Comments

(e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.1.8.3 ODB: Barring of outgoing international calls except to HPLMN country (ODB-BOICexHC)**

MS<sub>2</sub>(a) attempts a call to TestNbr3.

(a) MSISDN of MS<sub>2</sub>(a) .....

(b) TestNbr3 number keyed ... **0503** .....

(c) Test results:

Call attempt fails and no announcement is played to calling party [✓/X].....

(Which means test is PASSED)

VPLMN(b) barring announcement played[✓/X].....

(Which means test is PASSED)

Call is successful [✓/X].....

(Which means test is FAILED)

(d) Comments

(e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date. ....

***End of Appendix B1***

## Appendix B2

### ***IREG Stage 4 Test Results for Mobile Stations of PLMN(a) Roaming to PLMN(b) when using End-to-End Functional Capability Specification for inter-PLMN CAMEL-Roaming (CAMEL phase 2)***

#### **B.2.1 Network Operator Information**

HPLMN (a).....  
VPLMN (b) .....  
Date of Tests.....  
Testing personnel PLMN(b).....  
Tel/Fax:.....

SCP Manufacturer(s).....  
SCP Software Build Level(s) .....  
SCP Global Title(s) .....

Version of test application.....

HLR Manufacturer(s) .....  
HLR Software Build Level(s) .....  
HLR Global Title(s) .....

SMSC Manufacturer(s) .....  
SMSC Software Build Level(s) .....  
SMSC Global Title(s) .....

VMSC/VLR Manufacturer(s) .....  
VMSC/VLR Software Build Level(s) .....  
VMSC/VLR Global Title(s) .....

SSP Manufacturer(s) .....  
SSP Software Build Level(s) .....  
SSP Global Title(s) .....

TAP records resulting from the tests will be produced and transferred to the HPLMN [√=Yes/X=No].....

Comments:

## B 2.2 Test Results

The numbering of the test result sections within this appendix is identical to the associated Test case from section 2 of the main document.

### B 2.2.1 Location Update

Perform Location Update for MS<sub>4</sub>(a) and MS<sub>5</sub>(a)

#### B 2.2.1.1 Location Update by MS<sub>4</sub>(a) in VPLMN(b)

- (a) VLR Record contents:
- MSISDN of MS<sub>4</sub>(a) .....
  - IMSI of MS<sub>4</sub>(a).....
  - Teleservices **Speech (required)** [ =Yes/=No].....
  - SMS MO [ /]..... SMS MT [ /].....
  - Fax [ /].....
  - Supplementary Services:
  - BAOC [ /].....
  - BOIC [ /].....
  - BOICexHC (required)[ /].....
  - CFB [ /].....C Number.....
  - CFNRy [ /].....C Number.....
  - CFNRc [ /].....C Number.....
  - CW [ /].....
  - CH [ /].....
  - MPTY (required)** [ /].....
  - AoCI (required)** [ /].....
  - O-CSI (required)
  - TriggerDetectionPoint = TDP2 [ /] .....
  - ServiceKey..... equal to information provided by HPLMN(a): [ /]  
.....
  - GsmSCFAddress..... equal to information provided by HPLMN(a): [ /]  
.....
  - DefaultCallHandling equal to **releaseCall** [ /] .....
  - CamelCapabilityHandling equal to **CAMEL phase 2**
  - O-BcsmCamelTDP-CriteriaList (required)
  - MatchType equal to **enabling** [ /] .....
  - DestinationNumberLengthList equal to **4** [ /] .....
  - SS-CSI (required)
  - ssEventList equal to **MultyPTY** [ /] .....
  - gsmSCFAddress..... equal to information provided by  
HPLMN(a): [Yes/No] .....

Others.....

(b) Comments:

(c) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....

Time.....

Date.....

**B 2.2.1.2 Location Update by MS<sub>5</sub>(a) in VPLMN(b)**

- (a) VLR Record contents:
- MSISDN of MS<sub>5</sub>(a) .....
  - IMSI of MS<sub>5</sub>(a) .....
  - Teleservices **Speech (required)** [ =Yes/X=No].....
  - SMS MO [ /X]..... SMS MT [ /X].....
  - Fax[ /X].....
  - Supplementary Services:
  - BAOC [ /X].....
  - BOIC [ /X].....
  - BOICexHC [ /X].....
  - CFB [ /X].....C Number.....
  - CFNRy (required)** [ /X].....C Number.....
  - CFNRc [ /X].....C Number.....
  - CW [ /X].....
  - CH [ /X].....
  - MPTY [ /X].....
  - Operator Determined Barring:
  - ODB-BOICexHC is ACTIVE (required)** [Yes/No] .....
  - O-CSI (required)**
    - TriggerDetectionPoint = TDP2 [Yes/No] .....
    - ServiceKey: ..... equal to information provided by HPLMN(a): [Yes/No] .....
    - GsmSCFAddress.....equal to information provided by HPLMN(a): [Yes/No] .....
    - DefaultCallHandling equal to *continueCall* [Yes/No] .....
    - CamelCapabilityHandling... equal to **CAMEL phase 2**
    - Others .....
- (b) Comments:
- (c) Testcase Result [Pass/Fail/Not performed].....
- Signature of Tester.....Time..... Date.....

## B 2.2.2 Check Operation of IDP and DP2 Criteria

### B 2.2.2.1 Called Number of Length Within Destination Number Length List

MS<sub>4</sub>(a) calls TestNbr4.

- (a) MSISDN of originating MS (i.e. MS<sub>4</sub>(a)) .....
- (b) Number keyed into MS<sub>4</sub>(a) .... **5004** .....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (e) Duration of the announcement .....sec
- (f) Test results:  
 Announcement "Test is passed" was successfully played [/X].....  
 (Which means test is PASSED)  
 Announcement "Test is failed" played [/X].....  
 (Test is FAILED: Parameters of the IDP are missing but triggering criteria has been successfully implemented)  
 No announcement played [/X].....  
 (Which means test is FAILED: If test B.2.1.2 has been performed successfully it is likely triggering criteria has failed)
- (h) Comments:
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date.....

**B 2.2.2.2 Called Number of Length not Defined by Destination Number Length List**

MS<sub>4</sub>(a) calls AAC4. Number to be dialled in international format, i.e. starting with “+”.

- (a) MSISDN of originating MS (i.e. MS<sub>4</sub>(a)) .....
- (b) Number keyed into MS<sub>4</sub>(a) (AAC4).....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (e) Duration of the announcement .....sec
- (f) Test results:  
 Announcement "Test is passed" was successfully played [ / ].....  
 (Which means test is PASSED)  
 Announcement "Test is failed" played [ / ].....  
 (Which means test is FAILED)
- (g) Comments:
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.3 Check operation of PSI**

MS<sub>5</sub>(a) calls MS<sub>4</sub>(a) while MS<sub>4</sub>(a) is busy.

- (a) MSISDN of MS<sub>5</sub>(a) .....
- (b) MSISDN of called telephone MS<sub>4</sub>(a).....
- (c) Party with which MS<sub>4</sub>(a) is in conversation [DN] .....
- (d) Time of start of call .....hr.....min.....sec
- (e) Time of perceived answer of call .....hr.....min.....sec
- (f) Duration of the announcement .....sec
- (g) Test results:  
 Announcement "Test is passed" was successfully played [ / ].....  
       (Which means test is PASSED)  
 Any other announcement [ / ].....  
       (Which means test is FAILED)  
 Busy Tone is reached [ / ].....  
       (Which means test is FAILED)
- (h) Comments:
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

### B 2.2.4 Check reporting of EDP O\_Answer, O\_Disconnect and operation of RC

MS<sub>5</sub>(a) calls TestNbr11 and reaches Announcement 3 which is listened to by the calling party for 10 seconds.

- (a) Directory Number of calling telephone MS<sub>5</sub>(a) .....
- (b) Number dialed (TestNbr11) ..... **5011\*456#789**
- (c) Time of start of call (i.e. last digit dialed) .....hr .....min .....sec
- (d) Time of start of "Test is proceeding" announcement .....hr.....min.....sec
- (e) Duration of the announcement.....sec
- (f) Test results:  
Announcement "Test is proceeding" was successfully played and was released after 10 ± 1 seconds by the SCP [ $\sqrt{X}$ ].....  
(Which means test is PASSED)  
Announcement "Test is proceeding" was successfully played and was **NOT** disconnected after 10 ± 1 seconds by the SCP [ $\sqrt{X}$ ].....  
(Which means test is FAILED)
- (g) Comments:
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.5 Check operation of CUE and FCI with Follow-On Call****B 2.2.5.1 Follow-On Call due to “Called Party does not Reply”**

MS<sub>5</sub>(a) calls MS<sub>3</sub>(b) both roaming in VPLMN(b). MS<sub>3</sub>(b) does not answer the call.

- (a) MSISDN of originating MS (i.e. MS<sub>5</sub>(a)) .....
- (b) Number keyed into MS<sub>5</sub>(a) .....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Delay between SEND key operation at MS<sub>5</sub>(a) and MS<sub>3</sub>(b) alerting .... sec
- (e) Time of perceived answer of call ..... hr ..... min ..... sec
- (f) Duration of announcement..... sec
- (g) Test results:  
Announcement "Test is passed" was successfully played [ / ].....  
(Which means test is PASSED)  
Any other result [ / ].....  
(Which means test is FAILED)
- (h) Optional: ERB and FCI messages sent (checked by trace tool)? [Yes/No] .....
- (i) Comments:
- (j) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.5.2 Follow-On Call due to "Called Party is busy" (optional)**

MS<sub>5</sub>(a) calls MS<sub>3</sub>(b) both roaming in VPLMN(b). MS<sub>3</sub>(b) is busy.

- (a) MSISDN of originating MS (i.e. MS<sub>5</sub>(a)) .....
- (b) Number keyed into MS<sub>5</sub>(a) .....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call ..... hr ..... min ..... sec
- (e) Duration of announcement..... sec
- (f) Test results:  
Announcement "Test is passed" was successfully played [ / ].....  
(Which means test is PASSED)  
Any other result [ / ].....  
(Which means test is FAILED)
- (g) Optional: ERB and FCI messages sent (checked by trace tool)? [Yes/No] ...
- (h) Comments:
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.5. Follow-On Call due to “Called Party is NotReachable” (optional)**

MS<sub>5</sub>(a) calls MS<sub>3</sub>(b) both roaming in VPLMN(b). MS<sub>3</sub>(b) is switched off.

- (a) MSISDN of originating MS (i.e. MS<sub>5</sub>(a)) .....
- (b) Number keyed into MS<sub>5</sub>(a) .....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call ..... hr ..... min ..... sec
- (e) Duration of announcement..... sec
- (f) Test results:  
Announcement "Test is passed" was successfully played [ / ].....  
(Which means test is PASSED)  
Any other result [ / ].....  
(Which means test is FAILED)
- (g) Optional: ERB and FCI messages sent (checked by trace tool)? [Yes/No] .....
- (h) Comments:
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.5.4 Follow-On Call due to "RouteSelectFailure" by "Release before Answer" (optional)**

MS<sub>5</sub>(a) calls to a number in the number range of VPLMN(b).

- (a) MSISDN of originating MS (i.e. MS<sub>5</sub>(a)) .....
- (b) Number keyed into MS<sub>5</sub>(a) .....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Duration of announcement..... sec
- (e) Test results:  
Announcement "Test is passed" was successfully played [ / ].....  
(Which means test is PASSED)  
Any other result [ / ].....  
(Which means test is FAILED)
- (f) Optional: ERB and FCI messages sent (checked by trace tool)? [Yes/No] .....
- (g) Comments:
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

## B 2.2.6 Check operation of CIReq, SCI and AC

### B 2.2.6.1 Check correct reporting of call periods (1)

MS<sub>4</sub>(a) calls TestNbr5.

- (a) MSISDN of originating MS (i.e. MS<sub>4</sub>(a)) .....
- (b) Number keyed into MS<sub>4</sub>(a).....**5005**.....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (f) Text of announcement "Test is proceeding. The announcement will be disconnected after 30 seconds"
- (e) Duration of the announcement **30 seconds (required)** .[Yes/No]
- (f) Test results:  
Announcement "Test is Proceeding" is played for about 30 seconds followed by announcement "Test is passed" [/X].....  
(Which means test is PASSED)  
Announcement "Test is Proceeding" is played for about 30 seconds followed by announcement "Test is failed" or any other result [/X].....  
(Which means test is FAILED)
- (g) Comments:
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.6.2 Check reporting of call periods (2)**

MS<sub>4</sub>(a) calls TestNbr7.

- (a) MSISDN of originating MS (i.e. MS<sub>4</sub>(a)) .....
- (b) Number keyed into MS<sub>4</sub>(a).....**5007**.....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (f) Text of announcement: "Test is proceeding. The announcement will be disconnected after 30 seconds"
- (e) Duration of the announcement **30 seconds (required)** .[Yes/No]
- (f) Test results:  
Announcement "Test is Proceeding" is played for about 30 seconds followed by announcement "Test is passed [√ /X].....  
(Which means test is PASSED)  
Announcement "Test is Proceeding" is played for about 30 seconds followed by announcement "Test is failed" [√ /X].....  
(Test is FAILED)
- (g) Comments:
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....



### B 2.2.7 Check operation of ETC and DFC

MS<sub>4</sub>(a) calls TestNbr10.

- (a) MSISDN of originating MS (i.e. MS<sub>4</sub>(a)) .....
- (b) Number keyed into MS<sub>4</sub>(a).....**5010**.....
- (c) Time of start of call (i.e. SEND key operation).....hr .....min ....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (e) Text of first announcement (in HPLMN(a)).....
- (f) Duration of the announcement .....sec
- (g) Time of perceived second announcement .....hr.....min.....sec
- (h) Duration of the announcement .....sec
- (i) Test results:  
Announcement "Test is passed" was successfully played after first announcement (in HPLMN(a)) [ / ].....  
(Which means test is PASSED)
- Any other case [ / ].....  
(Test is FAILED)
- (j) Comments
- (k) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

## B 2.2.8 Check Default Call Handling

### B 2.2.8.1 defaultCallHandling set to continueCall

MS<sub>5</sub>(a) dials Test Announcement 1 ("Test is Passed"), and the call is connected. Number to be dialled in international format, i.e. starting with "+".

- (a) MSISDN of MS<sub>5</sub>(a).....
- (b) Number dialled by MS<sub>5</sub>(a) (Test Announcement 1) .....
- (c) Time of start of call (i.e. SEND key operation) .....hr.....min.....sec
- (d) Time of perceived answer of call .....hr.....min.....sec
- (e) Chargeable Call Duration (i.e. perceived answer until end of call) .....sec
- (f) Test results:  
Announcement "Test is Passed" was successfully played [ /X].....  
(Which means test is PASSED)  
Any other case [ /X].....  
(Which means test is FAILED)
- (g) Comments:
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.8.2 defaultCallHandling set to releaseCall**

MS<sub>6</sub>(a) dials Test Announcement 2 ("Test is Failed"), and the call is released (**NOT connected**). Number to be dialled in international format, i.e. starting with "+".

- (a) MSISDN of MS<sub>6</sub>(a).....
- (b) Number dialled by MS<sub>6</sub>(a) (Test Announcement 2) .....
- (c) Test results:  
 Call is released [ / ].....  
       (Which means test is PASSED)  
 Announcement "Test is Failed" was played [ / ].....  
       (Which means test is FAILED)
- (d) Comments:
- (e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.9 Check Suppression of Announcement**

MS<sub>3</sub>(b) calls MS<sub>5</sub>(a) which has removed the battery, and no VPLMN announcement is played (an HPLMN(a) announcement may be played).

(a) MSISDN of MS<sub>3</sub>(b) .....

(b) MSISDN of MS<sub>5</sub>(a) .....

(c) Test Result:

No announcement or HPLMN(a) announcement is played to calling party [/X].....

(Which means test is PASSED)

Any other case [/X].....

(Which means test is FAILED)

(d) The outcome of the test case is only reliable in case PLMN(b) plays an announcement on no paging response while SoA is not invoked. PLMN(b) supports an announcement on no paging response [=Yes/X=No].....

(e) Comments:

(f) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

## B 2.2.10 Interaction with GSM Supplementary Services and ODB

### B 2.2.10.1 Check Operation of SS-CSI, MPTY

MS<sub>4</sub>(a) calls TestNbr12 and places the call on hold. MS<sub>4</sub>(a) calls TestNbr13 and invokes a MultiParty Call.

- (a) MSISDN of MS<sub>4</sub>(a) .....
- (b) Number dialled by MS<sub>4</sub>(a) (TestNbr12) .....**5012**.....
- (c) Time of start of call .....hr.....min....sec
- (d) Time of perceived answer of call .....hr.....min....sec
- (e) Text of announcement is "Test proceeding" [Yes/No].....
- (f) Time of activation of SS- Call Hold .....hr.....min....sec
- (g) Second number dialled by MS<sub>4</sub>(a) (TestNbr13) .....**5013**.....
- (h) Time of start of call .....hr.....min....sec
- (i) Time of perceived answer of call .....hr.....min....sec
- (j) Text of announcement is "Test is proceeding. The announcement will be disconnected after 30 seconds" [Yes/No].....
- (k) Time of activation of SS- MultiParty .....hr.....min....sec
- (l) Test results:
  - Call released 10 seconds after the MultiParty establishment [ / ].....
  - (Which means test is PASSED)
  - Any other case [ / ].....
  - (Which means test is FAILED)

(m) Comments:

(n) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.10.2 Call Forwarding on no reply (CFNRy)**

MS<sub>3</sub>(b) calls MS<sub>5</sub>(a) which has activated Call Forwarding on No Reply to Test Announcement<sub>3</sub>.

- (a) MSISDN of MS<sub>5</sub>(a) .....
- (b) MSISDN of calling MS<sub>3</sub>(b) .....
- (c) DN of forwarded - to – Test Announcement 3 .....
- (d) Time of start of call .....hr.....min....sec
- (e) Delay between dialling last digit of MSISDN of MS<sub>5</sub>(a) at MS<sub>3</sub>(b) and MS<sub>5</sub>(a) ringing  
\_\_\_\_\_ sec
- (f) Length of time for which MS<sub>5</sub>(a) "rings" .....sec
- (g) Time of perceived answer of call .....hr.....min.....sec
- (h) Chargeable Call Duration (i.e. duration of announcement) ..... sec
- (i) Test results:  
Announcement "Test is Passed" was successfully played [ /X].....  
(Which means test is PASSED)  
Any other case [ /X].....  
(Which means test is FAILED)
- (j) Comments:
- (k) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.10.3 Barring of outgoing international calls except to HPLMN country (BOICexHC)**

MS<sub>4</sub>(a) activates BOICexHC and attempts a call to TestNbr9.

(a) MSISDN of MS<sub>4</sub>(a) .....

(b) TestNbr9 number keyed ..... **0509** .....

(c) Test results:  
Call attempt fails and no announcement or VPLMN barring announcement is played to calling party [ /X].....  
(Which means test is PASSED)

Call is successful [ /X].....  
(Which means test is FAILED)

(d) Comments:

(e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.2.10.4 ODB: Barring of outgoing international calls except to HPLMN country (ODB-BOICexHC)**

MS<sub>5</sub>(a) attempts a call to TestNbr9.

(a) MSISDN of MS<sub>5</sub>(a) .....

(b) TestNbr9 number keyed ..... **0509** .....

(c) Test results:  
Call attempt fails and no announcement or VPLMN barring announcement is played to calling party [/X].....  
    (Which means test is PASSED)  
Call is successful [/X].....  
    (Which means test is FAILED)

(d) Comments:

(e) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

***End of Appendix B2***

## Appendix B3

### ***IREG Stage 4 Test Results for Mobile Stations of PLMN(a) Roaming to PLMN(b) when using End-to-End Functional Capability Specification for inter-PLMN CAMEL-Roaming (CAMEL phase 3)***

#### **B.3.1 Network Operator Information**

HPLMN (a) .....  
VPLMN (b) .....  
Date of Tests .....  
Testing personnel PLMN(b) .....  
    Tel/Fax: .....  
SCP Manufacturer(s) .....  
SCP Software Build Level(s) .....  
SCP Global Title(s) .....  
Version of test application.....  
HLR Manufacturer(s) .....  
HLR Software Build Level(s) .....  
HLR Global Title(s) .....  
SMSC Manufacturer(s) .....  
SMSC Software Build Level(s) .....  
SMSC Global Title(s) .....  
VMSC/VLR Manufacturer(s) .....  
VMSC/VLR Software Build Level(s) .....  
VMSC/VLR Global Title(s) .....  
SSP Manufacturer(s) .....  
SSP Software Build Level(s) .....  
SSP Global Title(s) .....

TAP records resulting from the tests will be produced and transferred to the HPLMN  
[✓=Yes/X=No].....

Comments:

## B 2.3 Test Results

The numbering of the test result sections within this appendix is identical to the associated Test case from section 2 of the main document.

### B 2.3.1.1 Location Update / GPRS Attach

Perform Location Update for MS<sub>7</sub>(a) and MS<sub>8</sub>(a)

#### B 2.3.1.1.1 Location Update by MS<sub>7</sub>(a) in VPLMN(b)

- (a) VLR/SGSN Record contains:
- MSISDN of MS<sub>7</sub>(a) .....
  - IMSI of MS<sub>7</sub>(a) .....
  - Teleservices Speech [=Yes/=No].....
  - SMS (**TS22 required**) MO [/X]..... SMS MT [/X].....
  - Fax[/X].....
- (b) Supplementary Services
- BOIC exHC active for TS20 (required)[/X].....
  - BAOC [/X].....
  - BOIC [/X].....
  - CFB [/X].....C Number.....
  - CFNRy [/X].....C Number.....**
  - CFNRc [/X].....C Number.....
  - CW [/X].....
  - CH [/X].....
  - MPTY [/X].....
- SMS-CSI (required)
- TriggerDetectionPoint equal to **SMS\_CollectedInfo**: [Yes/No] .....
  - CamelCapabilityHandling equal to **CAMEL Phase 3** [Yes/No] .....
  - ServiceKey: ..... equal to information provided by
  - HPLMN(a): [Yes/No] .....
  - gsmSCFAddress..... equal to information provided by HPLMN(a):
  - [Yes/No] .....
  - DefaultSMSHandling equal to **continue** [Yes/No] .....
  - Others .....
- (b) Comments

(c) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....Time..... Date.....

**B 2.3.1.1.2 Location Update by MS<sub>g</sub>(a) in VPLMN(b)**

(a) VLR/SGSN Record contains:

MSISDN of MS<sub>g</sub>(a) .....

IMSI of MS<sub>g</sub>(a) .....

Teleservices Speech [=Yes/=No].....

SMS (**TS22 required**) MO [/]..... SMS MT [/].....

Fax[/].....

(b) Supplementary Services

BOIC exHC active for TS20 (required)[/].....

BAOC [/].....

BOIC [/].....

CFB [/].....C Number.....

**CFNRy [/].....C Number.....**

CFNRc [/].....C Number.....

CW [/].....

CH [/].....

MPTY [/].....

SMS-CSI (required)

TriggerDetectionPoint equal to **SMS\_CollectedInfo**: [Yes/No] .....

CamelCapabilityHandling equal to **CAMEL Phase 3** [Yes/No] .....

ServiceKey: ..... equal to information provided by  
HPLMN(a): [Yes/No] .....

gsmSCFAddress..... equal to information provided by  
HPLMN(a): [Yes/No] .....

DefaultSMSHandling equal to **release** [Yes/No] .....

Others .....

(c) Comments:

(d) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....

Time.....

Date.....

**B 2.3.1.2 Check operation of IDP\_SMS and CON\_SMS**

MS<sub>8</sub>(a) sends a SM to MS<sub>7</sub>(a) using *TestNbr14* as SMSC Address.

- (a) MSISDN of MS<sub>8</sub>(a) .....
- (b) E164 address of *TestNbr14* SMS - Service Centre Address .....  
 Time of transmitting to SMS - Service Centre .....hr.....min.....sec  
 Time of receipt of SMS at MS<sub>8</sub>(a) .....hr .....min .....sec  
 SM CallingPartyNumber correctly (*TestNbr15*) ? [Yes/No] .....

- (c) Was message correctly received? [Yes/No] .....

- (d) Test results:

Successful result if MS<sub>8</sub>(a) receives the SM sent previously from MS<sub>8</sub>(a) and CallingPartyNumber equals *TestNbr15* [✓/X].....

(Which means test is PASSED)

If no SM is received the test has failed. If MS<sub>7</sub>(a) receives the SM, at least one parameter of the IDP\_SMS is missing and the test has failed [✓/X].....

(Which means test is FAILED)

- (e) Comments:

- (f) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....



**B 2.3.1.4.1 Check defaultSMSHandling set to continue**

MS<sub>7</sub>(a), roaming in VPLMN(b), sends a SM to itself. SCP does not answer to InitialDPSMS. The Default SMS Handling of MS<sub>7</sub>(a) equals *continue*. The SM is forwarded to MS<sub>7</sub>(a).

(a) MSISDN of MS<sub>7</sub>(a) .....

(b) E164 address of HPLMN SMS - Service Centre Address .....  
Time of transmitting to SMS - Service Centre .....hr.....min.....sec  
Time of receipt of SMS at MS<sub>7</sub>(a) .....hr .....min .....sec

(c) Was message received at MS<sub>7</sub>(a)? [Yes/No] .....

(d) Test results:  
Successful result if the SM is received at MS<sub>7</sub>(a). [✓/X].....  
(Which means test is PASSED)  
If MS<sub>7</sub>(a) receives no SM the test has failed. [✓/X].....  
(Which means test is FAILED)  
If MS<sub>8</sub>(a) receives the SM the test has failed. [✓/X].....  
(Which means test is FAILED)

(e) Comments:

(f) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....



**B 2.3.1.5 Check operation of RR\_SMS\_Event, CUE\_SMS and ER\_SMS**

MS<sub>8</sub>(a), registered in VPLMN(b), sends a SM to MS<sub>3</sub>(b), using *HPLMN\_SMSC* as SMSC Address. The SCF should request the SSF to continue SMS processing without any changes. The Short Message is received at MS<sub>3</sub>(b).

- (a) MSISDN of MS<sub>8</sub>(a) .....  
 MSISDN of MS<sub>3</sub>(b) .....
- (b) E164 address of HPLMN SMS - Service Centre Address .....
- Time of transmitting to SMS - Service Centre .....hr.....min.....sec
- Time of receipt of SMS at MS<sub>3</sub>(b) .....hr .....min .....sec
- (c) Was message "*DP O\_SMS\_Submitted reported; the test passed*" received at MS<sub>8</sub>(a)?  
 [Yes/No]  
 Time of receipt of SMS at MS<sub>8</sub>(a) .....hr .....min .....sec
- (d) Test results:  
 Successful result if the SM is received at MS<sub>3</sub>(b). [/X].....  
 AND  
 If MS<sub>8</sub>(a) receives SM "*DP O\_SMS\_Submitted reported; the test passed.*" [/X]  
 (Which means test is PASSED)  
 If MS<sub>8</sub>(a) receives no SM the test has failed. [/X]  
 (Which means test is FAILED)  
 If MS<sub>3</sub>(b) receives no SM the test has failed. [/X].....  
 (Which means test is FAILED)
- (e) Comments
- (f) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

### B 2.3.1.6 Barring of outgoing international calls except to HPLMN country for SMS (BOICexHC) (optional)

MS<sub>7</sub>(a) sends a SM to itself with *TestNbr16* as SMSC address. The Supplementary Service "Barring of outgoing international calls except those directed to the HPLMN country" applies to MS<sub>7</sub>(a) for SMS (Teleservice 20). SCF alters the SMSC address to a SMSC located in country(c). It is checked that BOICexHC is executed correctly after mobile originated CAMEL service invocation. This test depends on the possibility to use a SMSC not belonging to the VPLMN or HPLMN, but which will correctly deliver the messages it receives.

- (a) MSISDN of MS<sub>7</sub>(a) .....
- (b) E164 address of *TestNbr16* SMS - Service Centre Address .....
- (c) Time of transmitting to SMS - Service Centre .....hr.....min.....sec
- (d) Time of barring of SMS at MS<sub>7</sub>(a) .....hr .....min .....sec
- (e) Was message "*DP O\_SMS\_Failure reported; the test passed.*" received at MS<sub>7</sub>(a)?  
[Yes/No]
- (f) Time of receipt of SMS at MS<sub>7</sub>(a) .....hr .....min .....sec
- (g) Test results:  
Successful result if the original SM is not received at MS<sub>7</sub>(a). [/X].....  
*AND*  
If MS<sub>7</sub>(a) receives SM "*DP O\_SMS\_Failure reported; the test passed.*" [/X]  
(Which means test is PASSED)  
If MS<sub>7</sub>(a) receives no SM "*DP O\_SMS\_Failure reported; the test passed* the test has failed. [/X]  
(Which means test is FAILED)  
If MS<sub>7</sub>(a) receives the original SM the test has failed. [/X]  
(Which means test is FAILED)
- (h) Comments:
- (i) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.1 GPRS-Attach**

Perform a GPRS-Attach only in VPLMN(b) for MS<sub>7</sub>(a) and MS<sub>8</sub>(a) and verify the successful insertion of subscriber data (GPRS\_CSI) in the SGSN(b).

**B 2.3.2.1.1 GPRS-Attach by MS<sub>7</sub>(a) in VPLMN(b) (GPRS Attach only)**

- (a) MS<sub>7</sub>(a) is in **READY State** [Yes/No] .....
  
- (b) MM context establishment between MS<sub>7</sub>(a) and SGSN(b) successful [Yes/No] ...
  
- (c) SGSN(b) record contains:  
 MSIDN of MS<sub>7</sub>(a) .....  
 IMSI/P-TMSI of MS<sub>7</sub>(a) .....  
 And at least the following entries shall be included in the SGSN record:  
 GPRS-CSI (required)  
     gprs-CamelTDPDataList [Yes/No] .....  
 GPRS-CamelTDPData  
     gprs-TriggerDetectionPoint **pdp-ContextEstablishment** [Yes/No] .....  
     ServiceKey: ..... equal to information provided by HPLMN(a):  
         [Yes/No] .....  
     gsmSCFAddress..... equal to information provided by HPLMN(a):  
         [Yes/No] .....  
     defaultSessionHandling equal to release Transaction  
         [Yes/No] .....  
 GPRS-CamelTDPData  
     gprs-TriggerDetectionPoint **pdp-ContextChangeOfPosition**  
         [Yes/No].....  
     ServiceKey: ..... equal to information provided by HPLMN(a):  
         [Yes/No] .....  
     gsmSCFAddress..... equal to information provided by HPLMN(a):  
         [Yes/No] .....  
     defaultSessionHandling equal to **continue Transaction**  
         [Yes/No] .....  
     CamelCapabilityHandling equal to **CAMEL Phase 3** [Yes/No] .....  
     Others .....
  
- (d) Comments:

(e) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....

Time.....Date.....

**B 2.3.2.1.2 GPRS-Attach by MS<sub>g</sub>(a) in VPLMN(b) (GPRS Attach only)**

- (a) MS<sub>g</sub>(a) is in **READY State** [Yes/No] .....
- (b) MM context establishment between MS<sub>g</sub>(a) and SGSN(b) successful [Yes/No] .....
- (c) SGSN(b) record contains

MSIDN of MS<sub>g</sub>(a) .....

IMSI/P-TMSI of MS<sub>g</sub>(a) .....

And at least the following entries shall be included in the SGSN record:

GPRS-CSI (required)

gprs-CamelTDPDataList [Yes/No] .....

GPRS-CamelTDPData

gprs-TriggerDetectionPoint **attach** [Yes/No] .....

ServiceKey: ..... equal to information provided by HPLMN(a):

[Yes/No] .....

gsmSCFAddress..... equal to information provided by HPLMN(a):

[Yes/No] .....

defaultSessionHandling equal to **continueTransaction** [Yes/No] .....

GPRS-CamelTDPData

gprs-TriggerDetectionPoint **attachChangeOfPosition** [Yes/No]

.....

ServiceKey: ..... equal to information provided by HPLMN(a):

[Yes/No] .....

gsmSCFAddress..... equal to information provided by HPLMN(a):

[Yes/No] .....

defaultSessionHandling equal to **releaseTransaction** [Yes/No] .....

CamelCapabilityHandling equal to **CAMEL Phase 3** [Yes/No] .....

Others .....

(d) Comments

(e) Testcase Result [Pass/Fail/Not performed].....

Signature of Tester.....

Time.....

Date.....



**B 2.3.2.2.2 Check used Volume, 3 PDP context periods, tariffSwitch in 2<sup>nd</sup> period**

MS<sub>7</sub>(a), GPRS attached (STANDBY or READY State) in VPLMN(b) sets up a PDP context to *TestAPN2* and is connected to *TestServer1*. MS<sub>7</sub>(a) transfers data. A tariff switch occurs in the second PDP context period. If the transferred volume in the PDP context periods is reported correctly, the SCP releases the PDP context after transmission of 30 Kbytes.

- (a) MSISDN of MS<sub>7</sub>(a) .....
- (b) Time of PDP context Activation to *TestAPN2* .....hr.....min.....sec
- (c) Time of being connected to *TestServer1* .....hr .....min .....sec
- (d) Time of transmitting data .....hr .....min .....sec
- (e) Time of release of PDP context (by SCF) .....hr .....min .....sec

Transmitted Volume 30.000 +/- 300 byte [Yes/ No].....

- (f) Test results:

Successful result if the data transfer of MS<sub>7</sub>(a) is released after 30.000+/- 300 byte [✓/X].....

(Which means test is PASSED)

In any other case the test is failed. [✓/X].....

(Which means test is FAILED)

- (g) Comments

- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

### B 2.3.2.2.3 Check used Time, 2 PDP context periods, tariffSwitch in 1st period

MS<sub>7(a)</sub>, GPRS attached (STANDBY or READY State) in VPLMN(b) sets up a PDP context to *TestAPN3* and is connected to *TestServer1*. MS<sub>7(a)</sub> transfers data. A tariff switch occurs in the first PDP context period. If the elapsed time in the first and second PDP context period is reported correctly, the SCF releases the PDP context after 15 sec.

- (a) MSISDN of MS<sub>7(a)</sub> .....
- (b) Time of PDP context Activation to *TestAPN3* .....hr.....min.....sec
- (c) Time of being connected to *TestServer1* .....hr .....min .....sec
- (d) Time of transmitting data .....hr .....min .....sec
- (e) Time of release of PDP context (by SCF) .....hr .....min .....sec

Release of data transmission after 15+/-2 sec [Yes/ No].....

Transmitted data volume .....byte

- (f) Test results:  
 Successful result if the data transfer of MS<sub>7(a)</sub> is released after a time period of 15 +/-2 sec [✓/X].....  
 (Which means test is PASSED)

In any other case the test is failed. [✓/X].....

(Which means test is FAILED)

- (g) Comments:

- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.2.4 Check used Time, 3 PDP context periods, tariffSwitch in 2<sup>nd</sup> period**

MS<sub>7</sub>(a), GPRS attached (STANDBY or READY State) in VPLMN(b) sets up a PDP context to *TestAPN4* and is connected to *TestServer1*. MS<sub>7</sub>(a) transfers data. A tariff switch occurs in the second PDP context period. If the elapsed time in the first and second PDP context periods are reported correctly, SCF grants new time and volume and continues the PDP context. MS<sub>7</sub>(a), initiates the PDP context disconnection.

- (a) MSISDN of MS<sub>7</sub>(a) .....
- (b) Time of PDP context Activation to *TestAPN4* .....hr.....min.....sec
- (c) Time of being connected to *TestServer1* .....hr .....min .....sec
- (d) Time of transmitting data .....hr .....min .....sec
- (e) MS<sub>7</sub>(a) actively disconnects the PDP context **after 30 sec** .....hr ....min ....sec  
Transmitted data volume ....byte
- (f) Test results:  
Successful result if the dPDP context remained active for more than 20 sec  
[✓/X].....  
(Which means test is PASSED)  
In any other case the test is failed. [✓/X].....  
(Which means test is FAILED)
- (g) Comments
- (h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.2.5 Parallel GPRS dialogues using GPRS CAMEL Scenario 2 (optional)**

MS<sub>7</sub>(a), GPRS attached (STANDBY or READY State) in VPLMN(b) sets up one GPRS dialogue to *TestAPN5* and is connected to *TestServer1* and a second GPRS dialogue to *TestAPN6* which is connected to *TestServer2*. MS<sub>7</sub>(a) transfers data. If the transferred volume for both PDP contexts is reported correctly, the SCF releases the GPRS dialogues.

- (a) MSISDN of MS<sub>7</sub>(a) .....
- (b) Time of PDP context Activation to *TestAPN5* .....hr.....min.....sec
- (c) Time of being connected to *TestServer1* .....hr .....min .....sec
- (d) Time of transmitting data within PDP Context 1 .....hr .....min .....sec
- (e) Time of PDP context Activation to *TestAPN6* .....hr.....min.....sec
- (f) Time of being connected to *TestServer2* .....hr .....min .....sec
- (g) Time of transmitting data within PDP Context 2 .....hr .....min .....sec
- (h) After transmitting 15.000+/-1.500 byte in total the:  
 PDP Context 1 is released (by SCF) at .....hr .....min .....sec  
 data transmitted ..... byte (if available)  
 PDP Context 2 is released (by SCF) at .....hr .....min .....sec  
 data transmitted .....byte (if available)
- (i) Test results:  
 Successful result if both GPRS dialogues are released after transmission of  
 15.000+/-1.500 byte in total [/X].....  
 (Which means test is PASSED)  
 In any other case the test is failed. [/X].....  
 (Which means test is FAILED)
- (j) Comments:
- (k) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.3 CAMEL - Scenario 1****B 2.3.2.3.1 Parallel PDP contexts using GPRS CAMEL Scenario 1 (optional)**

MS<sub>8</sub>(a), GPRS attached in VPLMN(b) sets up one PDP context to *TestAPN7* which is connected to *TestServer1* and a second PDP context to *TestAPN8* which is connected to *TestServer2*. MS<sub>8</sub>(a) transfers data via both of the PDP contexts. If the transferred volume of both PDP contexts is reported correctly, SCF releases the PDP contexts.

- (a) MSISDN of MS<sub>8</sub>(a) .....
- (b) Time of switching on Mobile containing MS<sub>8</sub>(a) and performing a GPRS-attach .....hr.....min.....sec
- (c) Time of PDP context Activation to TestAPN7 .....hr.....min.....sec
- (d) Time of being connected to TestServer1 .....hr .....min .....sec
- (e) Time of transmitting data within PDP Context 1 .....hr .....min .....sec
- (f) Time of PDP context Activation to TestAPN8 .....hr.....min.....sec
- (g) Time of being connected to TestServer2 .....hr .....min .....sec
- (h) Time of transmitting data within PDP Context 2 .....hr ....min .....sec
- (i) After transmitting 15.000+/-1.500 byte in total the:  
 PDP Context 1 is released (by SCF) at .....hr .....min .....sec data transmitted .....byte (if available)  
 PDP Context 2 is released (by SCF) at .....hr .....min .....sec data transmitted .....byte (if available)
- (j) Time of switching of the Mobile (GPRS-detach) .....hr .....min .....sec
- (k) If HPLMN(a) indicates that SCF-initiated SMS is supported, switch on the mobile to receive SM:
- (l) Time of switching on the mobile .....hr .....min .....sec
- (m) Time of receiving the SM .....hr .....min .....sec
- (n) Test results:  
 Successful result if both PDP context are released after transmission of 15.000+/-1.500 byte in total [✓/X].....  
 (Which means test is PASSED)  
 In any other case the test is failed. [✓/X].....  
 (Which means test is FAILED)
- (o) Comments
- (p) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.3.2 Check Default GPRS handling set to continue**

MS<sub>8</sub>(a), GPRS attached (STANDBY or READY State) in VPLM(b), sets up a PDP context to *TestServer1*. SCF responds to ERgprs(PCEack) with TCAP Abort. The defaultGPRShandling of MS<sub>8</sub>(a) equals continue. If the PDP context is established, the test is passed.

(a) MSISDN of MS<sub>8</sub>(a) .....

(b) Time of PDP context Activation to *TestServer1* .....hr.....min.....sec

(c) Time of being connected .....hr .....min .....sec

Time of deactivation of PDP context by MS<sub>8</sub>(a) .....hr.....min .....sec

Transmitted data volume .....byte

Test results:

Successful result if the PDP context is established due to setting of the defaultGPRShandling=continue [✓/X].....  
(Which means test is PASSED)

In any other case the test is failed. [✓/X].....  
(Which means test is FAILED)

(g) Comments

(h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.4 Check Default GPRS handling set to release within CAMEL Scenario 2****B 2.3.2.4.1 Abort during PDP context establishment**

MS<sub>7</sub>(a), GPRS attached (STANDBY or READY State) in VPLM(b), attempts to set up a PDP context to *TestServer1*. SCF responds to ERBgprs(PCEack) with TCAP Abort. The defaultGPRShandling of MS<sub>7</sub>(a) equals release. If the PDP context is **not** established, the test is **passed**.

(a) MSISDN of MS<sub>7</sub>(a) .....

(b) Time of PDP context Activation to *TestServer1* .....hr.....min.....sec

(c) Time of releasing the PDP context activation attempt by SCF .....hr.....min .....sec

(d) Test results:

Successful result if the PDP context is **not** established due to setting of the defaultGPRShandling=release [/X].....

(Which means test is PASSED)

In any other case the test is failed. [/X].....

(Which means test is FAILED)

(e) Comments:

(f) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.4.2 Abort during active PDP context**

MS<sub>7(a)</sub>, GPRS attached (STANDBY or READY State) in VPLM(b), attempts to set up a PDP context to *TestAPN10* which connects *TestServer1*. SCF sends TCAP Abort 10 seconds after PDP context is established. The defaultGPRShandling of MS<sub>7(a)</sub> equals release. If the PDP context is **not** disconnected (before 10 +/-2 sec) the test is passed.

- (a) MSISDN of MS<sub>7(a)</sub> .....
- (b) Time of PDP context Activation to *TestAPN10* .....hr.....min.....sec
- (c) Time of being connected to *TestServer1* .....hr.....min .....sec
- (d) Time of PDP context being released .....hr.....min .....sec  
(After 10+/-2 sec the SCF releases the PDP context)

Transmitted data volume.....byte

Test results:

Successful result if the PDP context is disconnected after 10+/- 2 sec due to setting of the defaultGPRShandling=release in case of an active PDP context is aborted.

[✓/X].....

(Which means test is PASSED)

In any other case the test is failed. [✓/X].....

(Which means test is FAILED)

(g) Comments

(h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.2.5 Check correct operation of EntityReleasedGPRS procedure (Optional)**

MS7(a), GPRS attached in VPLMN(b), sets up a PDP context to TestAPN9 and is connected to TestServer1. After the PDP context is established the tester terminates the session. The operation of the CAP3 information flow EntityReleasedGPRS is verified. If supported, the gprsSCF generates a SM in order to inform the tester about the test result.

- (a) MSISDN of MS7(a) .....
- (b) Time of PDP context Activation to *TestServer1* .....hr.....min.....sec
- (c) Time of being connected .....hr .....min .....sec
- (d) Time of deactivation of PDP context by MS7(a) .....hr.....min .....sec
- (e) Transmitted data volume .....byte

(f) Test results:

Successful result if gprsSCF has terminated the context by sending EntityReleasedGPRS [✓/X].....  
(Which means test is PASSED)

If supported in PLMN(a): A SMS is with the content ERELgprs received. Test is passed." Is received [✓/X].....  
(Which means test is PASSED)

In any other case the test is failed. [✓/X].....  
(Which means test is FAILED)

(g) Comments

(h) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

## B 2.3.3 Mobility Management

### B 2.3.3.1 IMSI Attach, IMSI Detach and Location update in the same VLR area with the same LAI

MS<sub>7</sub>(a) registers in VPLMN(b) and once Location Update successfully completed, MS<sub>7</sub>(a) is switched off. To verify test result, MS<sub>7</sub>(a) is again switched on and registers in VPLMN(b).

(a) VLR Record contents:

MSISDN of MS<sub>7</sub>(a) .....  
 IMSI of MS<sub>7</sub>(a) .....  
 Teleservices Speech [ =Yes/X=No].....  
 SMS MO [ /X]..... SMS MT [ /X].....  
 M-CSI (required)  
 MobilityTriggers:  
   Location update in the same VLR service area (0) [ =Yes/X=No].....  
   Location update to another VLR service area (1) [ =Yes/X=No].....  
   IMSI attach (2) ]..... [ =Yes/X=No].....  
   User initiated IMSI Detach (3) ..... [ =Yes/X=No].....  
   Network initiated IMSI Detach (4) ..... [ =Yes/X=No].....  
   ServiceKey: equal to information provided by HPLMN(a): [Yes/No] .....  
   GsmSCFAddress: equal to information provided by HPLMN(a): [Yes/No]  
   CamelCapabilityHandling... equal to **CAMEL phase 3**  
 Others .....

(b) Test results:

Short Message received with the text: "IMSI attach: test OK]" .....[ /X].....  
 (Which means "IMSI attach" test is PASSED. Please note that two SM with this text will be received)

Short Message received with the text: "IMSI detach: test OK]" ..... [ /X].....  
 (Which means "IMSI detach" test is PASSED)

(c) Comments:

(d) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.3.2 Location update by MS7(a) in the same VLR of VPLMN(b) with different LAI (optional)**

MS<sub>7</sub>(a) registered in VPLMN(b) moves to another Location Area within the same VLR service area. Tester is aware of geographical position of neighbouring Location Areas.

(a) Test result:

Short Message received with the text: "Update location in the same VLR: test OK]"  
..... [ /X].....

(Which means "Update location in the same VLR service area " test is PASSED.  
Please note that two SM with this text will be received)

(b) Comments:

(c) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

**B 2.3.3.3 Location update by MS7(a) in another VLR area of VPLMN(b) (optional)**

MS7(a) registered in VPLMN(b) moves towards a new VLR service area. Tester is aware of geographical position of neighbouring Location Areas.

(a) Test result:

Short Message received with the text: "Update location in another VLR: test OK"  
..... [ /X] .....

(Which means "Update location in another VLR service area " test is PASSED.  
Please note that two SM with this text will be received)

(b) Comments:

(c) Testcase Result [Pass/Fail/Not performed] .....

Signature of Tester.....

Date .....

***End of Appendix B3***

## APPENDIX C1

### ***Completion Certificate for GSMA-IREG Stage 4 Testing for Inter-PLMN Roaming for CAMEL Phase 1.***

This certificate confirms the successful completion of GSMA-IREG Stage 4 Tests (CAMEL Phase 1) for Mobile Subscribers of.....PLMN visiting.....PLMN.

The Services tested were:

CAMEL PHASE 1 [Pass / Fail / Not applicable].....

Other Comments:

Toll Ticket file is being forwarded from ..... PLMN to .....PLMN via TADIG procedures. (Delete if not applicable)

The tests were completed on.....(date).

The testing team in PLMN.....

Were:.....

The testing team in PLMN.....

Were:.....

Signed.....

Date.....

PLMN.....

Signed.....

Date.....

PLMN.....

***End of Appendix C1***

## APPENDIX C2

### ***Completion Certificate for GSMA-IREG Stage 4 Testing for Inter-PLMN Roaming for CAMEL Phase 2.***

This certificate confirms the successful completion of GSMA-IREG Stage 4 Tests (CAMEL Phase 2) for Mobile Subscribers of.....PLMN visiting.....PLMN.

The Services tested were:

CAMEL PHASE 2 [Pass / Fail / Not applicable].....

Other Comments:

Toll Ticket file is being forwarded from ..... PLMN to .....PLMN via TADIG procedures. (Delete if not applicable)

The tests were completed on.....(date).

The testing team in PLMN.....

Were:.....

The testing team in PLMN.....

Were:.....

Signed.....

Date.....

PLMN.....

Signed.....

Date.....

PLMN.....

***End of Appendix C2***

## APPENDIX C3

### ***Completion Certificate for GSMA-IREG Stage 4 Testing for Inter-PLMN Roaming for CAMEL Phase 3.***

This certificate confirms the successful completion of GSMA-IREG Stage 4 Tests (CAMEL Phase 3) for Mobile

Subscribers of .....PLMN visiting.....PLMN.

The Services tested were:

CAMEL PHASE 3 [Pass / Fail / Not applicable].....

Other Comments:

Toll Ticket file is being forwarded from ..... PLMN to .....PLMN via TADIG procedures. (Delete if not applicable)

The tests were completed on.....(date).

The testing team in PLMN.....

Were:.....

The testing team in PLMN.....

Were:.....

Signed.....

Date.....

PLMN.....

Signed.....

Date.....

PLMN.....

## Annex A Document Management

### A.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
0.0.1	15.07.1999	IREG Doc 10/99 with changes according to 1 <sup>st</sup> Meeting of IREG CAMEL	IREG	
0.0.3	05.08.1999	Changes according to 2 <sup>nd</sup> Meeting of IREG CAMEL-WP	IREG	
0.0.4	06.09.1999	Pre-Final Version; Input for IREG #37.	IREG	
3.0.0	21.09.1999	Final Version for approval	IREG	
3.0.1	12.01.2000	Changes according to 3 <sup>rd</sup> Meeting of IREG CAMEL-WP	IREG	
3.0.2	31.01.2000	Changes according to 5 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.0.3	13.03.2000	Changes according to email discussions since the 5 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.1.0	14.03.2000	Changes according to 6 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.1.1	06.02.2001	Clarification in test case 2.1.5 Corrections to test case 2.2.4 and according change in Appendix B 2.2.4 Corrections to test case 2.2.7 Correction in chapter 3.1 Corrections to appendix B 2.1.4 Corrections to appendix B 2.1.5 Corrections to appendix B 2.1.8.1	IREG	
3.2.0	21.10.2001	Changes according to 8 <sup>th</sup> and 9 <sup>th</sup> Meeting of IREG CAMEL-WP	IREG	
3.3.0	31.01.2003	Test cases 2.1.6.1, 2.1.6.2, 2.2.8.1 and 2.2.8.2: In case SCP does not allow sending no answer to IDP an Abort message should be sent. Chapter 2.3 "Camel Phase 3" included Changes included Chapter 3.4 "User Equipment for CAMEL phase 3 tests" included Annex A.1 enhanced with CAMEL Ph3 information Annex A.3 included	IREG	
3.3.1	22.05.2003	Test-sheets for CAMEL Ph3 added	IREG	
3.3.2	20/10/2004	Corrections to test case 2.2.6.3	IREG	
3.3.3	13/10/2005	Corrections to test case 2.2.6.1 Corrections to test case 2.2.6.3	IREG	

It is our intention to provide a quality product for your use. If you find any errors or omissions, please contact us with your comments. You may notify us at [prd@gsma.com](mailto:prd@gsma.com)

Your comments or suggestions & questions are always welcome.