

3GPP TSG CN Plenary Meeting #14
Kyoto, JAPAN, 12th-14th December 2001

NP-010623

Source: TSG CN WG4
Title: CRs on Rel-4 Technical Enhancements and Improvements
Agenda item: 8.12
Document for: APPROVAL

Introduction:

This document contains 7 CRs on Rel-4 Work Item "TEI4", that have been agreed by TSG CN WG4, and are forwarded to TSG CN Plenary meeting #14 for approval.

| Spec | CR | Rev | Doc-2nd-Level | Phase | Subject | Cat | Ver_C |
|-------------|-----------|------------|----------------------|--------------|---|------------|--------------|
| 23.083 | 008 | | N4-011042 | Rel-4 | Missing connector in procedure Process_Call_Waiting | F | 4.2.0 |
| 29.060 | 255 | | N4-011047 | Rel-4 | Add APN.OI sub-field to the APN in PDP context IE | F | 4.2.0 |
| 29.060 | 264 | | N4-011104 | Rel-4 | Clarification of header marker setting for Error Indication | F | 4.2.0 |
| 29.002 | 314 | | N4-011043 | Rel-4 | Handling of linked operations in the MAP protocol machine | F | 4.5.0 |
| 29.002 | 325 | | N4-011097 | Rel-4 | Clarifications on long forwarded-to numbers | F | 4.5.0 |
| 29.002 | 349 | 2 | N4-011437 | Rel-4 | Handling of MNRR in the HLR & SMS-GMSC | F | 4.5.0 |
| 29.002 | 337 | 1 | N4-011177 | Rel-4 | Correction of references | F | 4.5.0 |

CHANGE REQUEST

⌘ **23.083 CR 008** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

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

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

| | | | |
|------------------------|--|-----------------|---|
| Title: | ⌘ Missing connector in procedure Process_Call_Waiting | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ TEI4 | Date: | ⌘ 25/9/01 |
| Category: | ⌘ F Agreed by consensus | Release: | ⌘ REL-4 |
| | <i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. | | <i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5) |

| | |
|--------------------------------------|--|
| Reason for change: | ⌘ During the implementation of CRs introducing MultiCall functionality, the procedure Process_Call_Waiting got expanded to cover more pages and make the diagrams less "busy". Unfortunately receiving connector number 5 got deleted. |
| Summary of change: | ⌘ Addition of connector number 5 to sheet 6 of procedure Process_Call_Waiting. |
| Consequences if not approved: | ⌘ Incorrect working of procedure Process_Call_Waiting. |

| | | |
|------------------------------|--|---|
| Clauses affected: | ⌘ 1.2 | |
| Other specs affected: | ⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications | ⌘ |
| Other comments: | ⌘ Procedure Process_Call_Waiting in R99 is in 3GPP TS 23.018 (the procedure was moved into 23.083 for REL-4 by a Vodafone CR) and was previously Process_Call_Waiting_MSC. | |

1 Call waiting (CW)

...

1.2 Functions and information flows

...

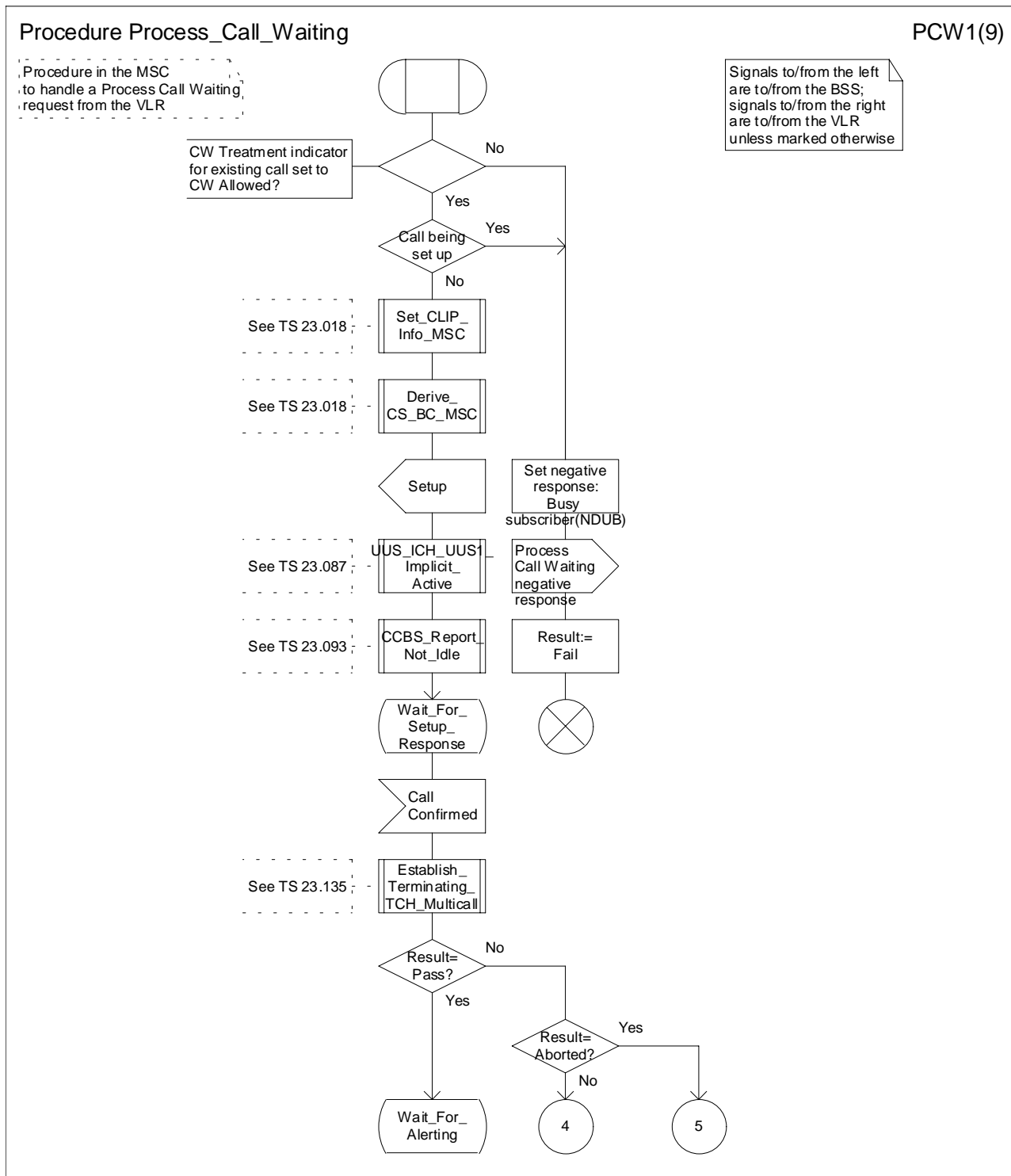


Figure 1.5 (sheet 1 of 9): Procedure Process_Call_Waiting

Procedure Process_Call_Waiting

PCW6(9)

Procedure in the MSC to handle a Process Call Waiting request from the VLR

Signals to the right are to the VLR

See TS 23.018

See TS 23.078

See TS 23.078

See TS 23.078

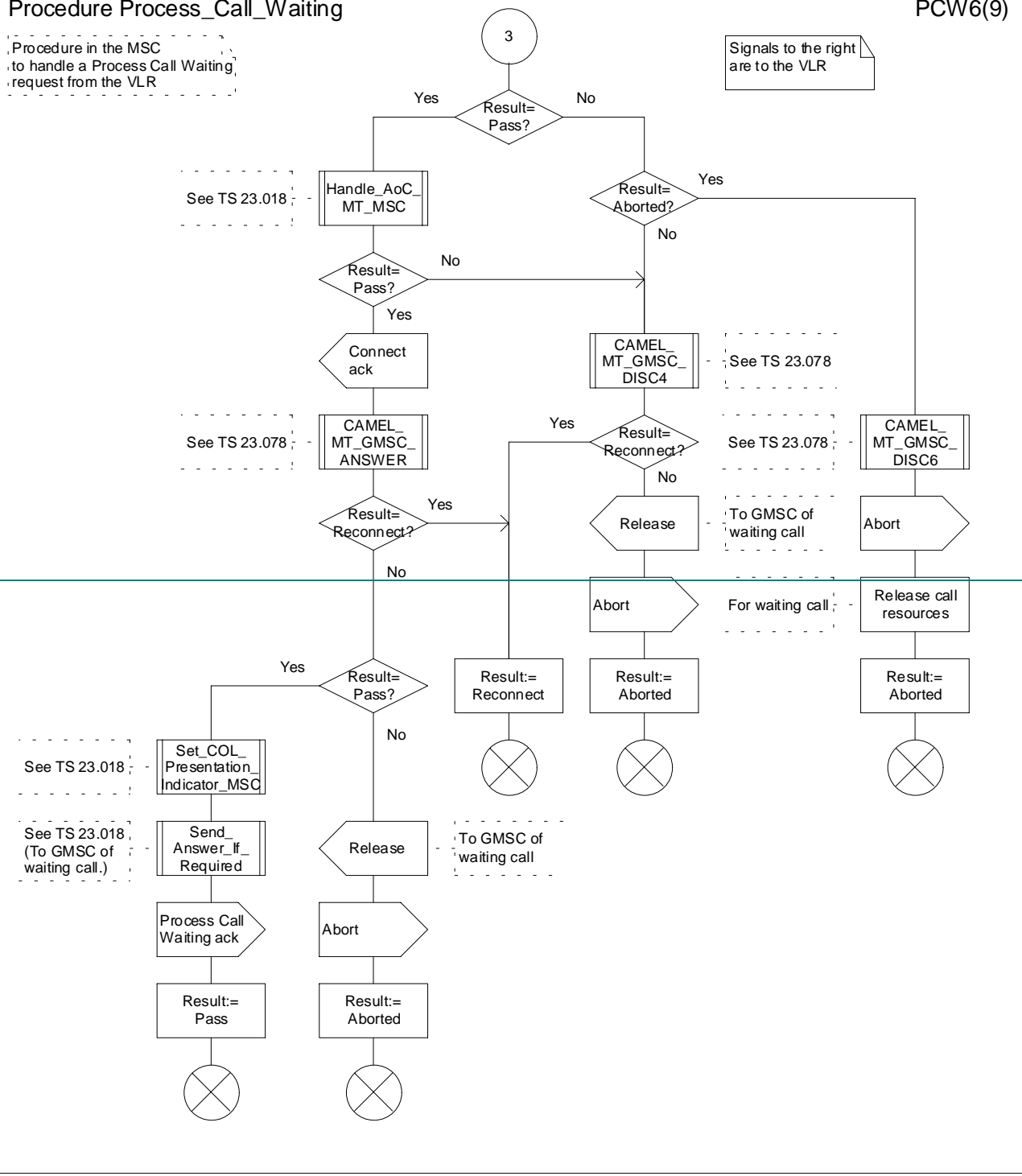
To GMSC of waiting call

For waiting call

See TS 23.018

See TS 23.018 (To GMSC of waiting call.)

To GMSC of waiting call



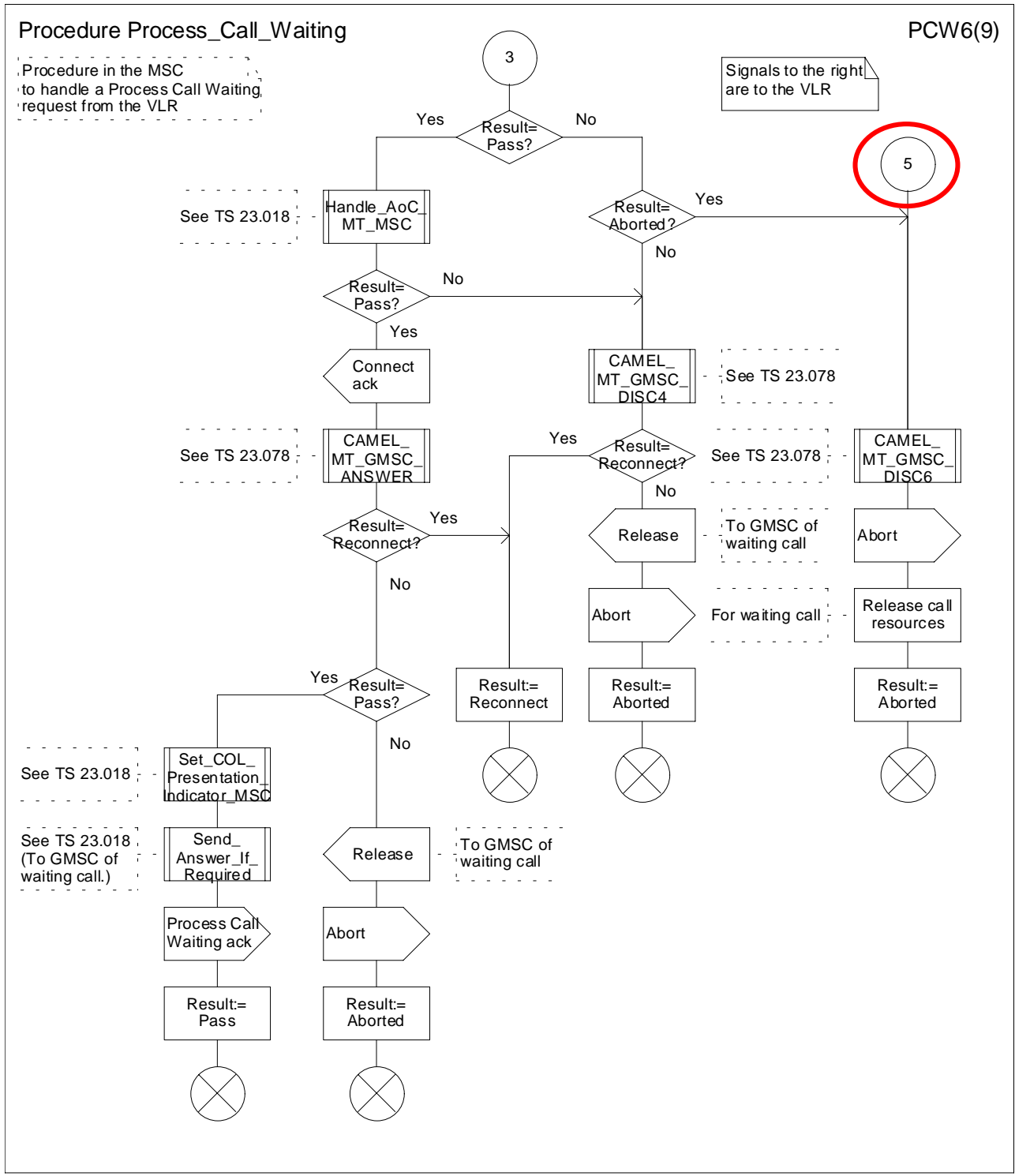


Figure 1.5 (sheet 6 of 9): Procedure Process_Call_Waiting

CHANGE REQUEST

⌘ **29.002 CR 314** ⌘ rev **-** ⌘ Current version: **4.5.0** ⌘

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

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

| | | | |
|------------------------|--|-----------------|---|
| Title: | ⌘ Handling of linked operations in the MAP protocol machine | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ TEI4 | Date: | ⌘ 10 Sep 2001 |
| Category: | ⌘ F Agreed by consensus | Release: | ⌘ REL-4 |
| | <i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. | | <i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5) |

| | |
|--------------------------------------|---|
| Reason for change: | ⌘ The check on the admissibility of a linked operation is unclear; the text in R99 which described the check was omitted when the SDL definition was restructured in Rel-4 as part of the MAP application security changes. |
| Summary of change: | ⌘ Add text to clarify the decision "Linked_Operation_Allowed" |
| Consequences if not approved: | ⌘ Lack of clarity leading to incorrect implementation |

| | | |
|------------------------------|--|--|
| Clauses affected: | ⌘ 15.5.1 | |
| Other specs affected: | <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications | |
| Other comments: | ⌘ | |

How to create CRs using this form:

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

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

15.5.1 Service invocation for unsecured dialogues

The behaviour of the requesting SSM which handles a service for an unsecured dialogue is defined by the SDL for the process Requesting_MAP_SSM. The requesting SSM receives a MAP service request from the MAP-Service User via the MAP dialogue state machine and sends a TC-INVOKE request to TCAP. When a confirm is received from TCAP via the MAP dialogue state machine, the requesting SSM forwards a MAP service confirm to the MAP-Service User.

The response to a MAP service invocation may come in the form of a linked request. If the linked request corresponds to a class 4 operation, this is handled by the requesting SSM. If the linked request corresponds to a class 1, 2 or 3 operation, the MAP dialogue state machine sends a notification to the requesting SSM and creates an instance of a performing SSM to handle the linked request. The test "Linked Operation Allowed" on sheet 3 of the process Requesting_MAP_SSM takes the (TRUE) exit if the definition of the parent operation includes the received linked operation as a permitted linked operation; otherwise the test takes the (FALSE) exit.

The mapping of MAP specific services on to remote operations is given in table 16.2/1.

CR-Form-v4

CHANGE REQUEST

⌘ **29.002 CR 325** ⌘ ev **-** ⌘ Current version: **4.5.0** ⌘

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

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

| | | | |
|------------------------|--|---|--------------|
| Title: | ⌘ Clarifications on long forwarded-to numbers | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ TEI4 | Date: | ⌘ 2001-10-04 |
| Category: | ⌘ F Agreed by consensus Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. | Release: | ⌘ REL-4 |
| | | Use <u>one</u> of the following releases: | |
| | | 2 (GSM Phase 2) | |
| | | R96 (Release 1996) | |
| | | R97 (Release 1997) | |
| | | R98 (Release 1998) | |
| | | R99 (Release 1999) | |
| | | REL-4 (Release 4) | |
| | | REL-5 (Release 5) | |

| | |
|--------------------------------------|--|
| Reason for change: | ⌘ Some country codes (1, 7) are common to more than one country. The network destination code is needed to determine whether the forwarded-to number belongs or not to the HPLMN country. |
| Summary of change: | ⌘ The NAI for a long forwarded-to number shall include the network destination code (NDC). |
| Consequences if not approved: | ⌘ Supplementary services procedures could not determine whether the forwarded-to number belongs or not to the HPLMN country in cases where the same country code is used in more than one country. |

| | | | |
|------------------------------|---|---|--|
| Clauses affected: | ⌘ 17.7.8 | | |
| Other specs affected: | ⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications | ⌘ | |
| Other comments: | ⌘ | | |

How to create CRs using this form:

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

17.7.8 Common data types

...

```
FTN-AddressString ::=
    AddressString (SIZE (1..maxFTN-AddressLength))
    -- This type is used to represent forwarded-to numbers.
    -- For long forwarded-to numbers (longer than 15 digits) NPI shall be unknown;
    ---if NAI = international the first digits represent the country code (CC)
    -- and the network destination code (NDC) as for E.164.
```

...

CHANGE REQUEST

⌘ **29.002 CR 337** ⌘ rev **1** ⌘ Current version: **4.5.0** ⌘

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

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

| | | | |
|------------------------|--|-----------------|---|
| Title: | ⌘ Correction of references | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ TEI4 | Date: | ⌘ 10 Oct. 01 |
| Category: | ⌘ F Agreed by consensus | Release: | ⌘ REL-4 |
| | <i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. | | <i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5) |

| | |
|--------------------------------------|---|
| Reason for change: | ⌘ Within the definitions of the ASN.1 data types "ProtocollId" and "AccessNetworkProtocollId" the identifier "gsm-0806" identifies two different Named Numbers. |
| Summary of change: | ⌘ Replace the identifier "gsm-0806" within the definition of AccessNetworkProtocollId with "ts3G-48006". |
| Consequences if not approved: | ⌘ Identical ASN.1 identifier for different Named Numbers could cause confusion. |

| | | | |
|------------------------------|---|---|--|
| Clauses affected: | ⌘ 17.7.8 | | |
| Other specs affected: | ⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications | ⌘ | |
| Other comments: | ⌘ | | |

How to create CRs using this form:

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

17.7.8 Common data types

• • • • •

```
ProtocolId ::= ENUMERATED {  
    gsm-0408 (1),  
    gsm-0806 (2),  
    gsm-BSSMAP (3),  
    -- Value 3 is reserved and must not be used  
    ets-300102-1 (4)}
```

• • • • •

```
AccessNetworkProtocolId ::= ENUMERATED {  
    ts3G-48006gsm-0806 (1),  
    ts3G-25413 (2),  
    ...}  
-- exception handling:  
-- For AccessNetworkSignalInfo sequences containing this parameter with any  
-- other value than the ones listed the receiver shall ignore the whole  
-- AccessNetworkSignalInfo sequence.
```

• • • • •

CHANGE REQUEST

⌘ **29.002 CR 349** ⌘ rev **2** ⌘ Current version: **4.5.0** ⌘

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

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

| | | | |
|------------------------|--|-----------------|---|
| Title: | ⌘ Handling of MNRR in the HLR & SMS-GMSC | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ TEI4 | Date: | ⌘ 29 November 2001 |
| Category: | ⌘ F Agreed by consensus Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. | Release: | ⌘ REL-4 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5) |

| | |
|--------------------------------------|---|
| Reason for change: | ⌘ If an SMS-GMSC obtains routing information (by marking the request as high priority) to deliver a short message when the HLR has marked the MS as not reachable, and the delivery attempt fails, the SMS-GMSC does not update the failure information (particularly the MNRR) in the HLR even though the failure information is more up-to-date than the information in the HLR. This reduces the usefulness of the MNRR. |
| Summary of change: | ⌘ Clarify that the SMS-GMSC updates the information in the HLR if the information received from the VMSC is different from the information received in the HLR. Add the absentSubscriberDiagnosticSM parameter to InformServiceCentreArg. |
| Consequences if not approved: | ⌘ The MNRR in the HLR serves very little useful purpose |

| | |
|------------------------------|--|
| Clauses affected: | ⌘ 12.6; 17.7.6; 23.3.4 |
| Other specs affected: | ⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications |
| Other comments: | ⌘ A fuller explanation of the rationale for the CR is given in N4-011353 |

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

12.6 MAP-INFORM-SERVICE-CENTRE service

12.6.1 Definition

This service is used between the HLR and the gateway MSC to inform the Service Centre which MSISDN number is stored in the Message Waiting Data file. If the stored MSISDN number is not the same as the one received from the gateway MSC in the MAP-SEND-ROUTING-INFO-FOR-SM service primitive the stored MSISDN number is included in the message.

Additionally the status of MCEF, MNRF and MNRG flags and the inclusion of the particular Service Centre address in the Message Waiting Data list is informed to the gateway MSC when appropriate.

If the HLR has stored the MNRR, the value is included in the Additional Absent Subscriber Diagnostic SM parameter.

The MAP-INFORM-SERVICE-CENTRE service is a non-confirmed service using the primitives from table 12.6/1.

12.6.2 Service primitives

Table 12.6/1: MAP-INFORM-SERVICE-CENTRE

| Parameter name | Request | Indication |
|---------------------------------|---------|------------|
| Invoke Id | M | M(=) |
| MSIsdn-Alert | C | C(=) |
| MWD Status | C | C(=) |
| Absent Subscriber Diagnostic SM | C | C(=) |

12.6.3 Parameter use

Invoke id

See definition in clause 7.6.1.

MSIsdn-Alert

See definition in clause 7.6.2 This parameter refers to the MSISDN stored in a Message Waiting Data file in the HLR.

MWD Status

See definition in clause 7.6.8. This parameter indicates the status of the MCEF, MNRF and MNRG flags and the status of the particular SC address presence in the Message Waiting Data list.

Absent Subscriber Diagnostic SM

See definition in clause 7.6.8.

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

17.7.6 Short message data types

. . .
 Unmodified ASN.1
 . . .

| | | |
|--|------------------------------|-----------|
| InformServiceCentreArg ::= SEQUENCE { | | |
| storedMSISDN | ISDN-AddressString | OPTIONAL, |
| mw-Status MW-Status | OPTIONAL, | |
| extensionContainer | ExtensionContainer | OPTIONAL, |
| ... | | |
| absentSubscriberDiagnosticSM | AbsentSubscriberDiagnosticSM | OPTIONAL} |

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

23.3.4 Procedures in the gateway MSC

The short message handling function of the GMSC will request routing information when a mobile terminated short message is received from a Service Centre. The GMSC sends the MAP_SEND_ROUTING_INFO_FOR_SM request to the HLR containing the subscriber data of the mobile subscriber and the indication that the SMS-GMSC supports the GPRS functionality.

As an outcome of the procedure the MAP_SEND_ROUTING_INFO_FOR_SM confirmation is received indicating:

- an unsuccessful event indication containing an error;

The mapping between the MAP error causes and the RP_ERROR causes is explained in GSM 03.40.

- a successful event indication containing following parameters:

- an IMSI optionally accompanied by an LMSI; and
- routing addresses (servicing MSC, SGSN or both numbers).

The LMSI shall not be used in case the short message is routed towards the SGSN.

The GMSC may also receive a MAP_INFORM_SERVICE_CENTRE indication after the MAP_SEND_ROUTING_INFO_FOR_SM confirmation. The parameter MW Status in the message indicates whether or not the Service Centre address is stored in the Message Waiting Data. It also indicates the status of the MCEF, MNRF and MNRG flags in the HLR. The message also indicates the value of the MNRR if this is stored in the HLR and one or both of the MNRF and MNRG flags is set in the HLR.

If the MSISDN-Alert stored in the MWD data is not the same as the one sent to the HLR, the MSISDN-Alert is received in the MAP_INFORM_SERVICE_CENTRE indication. This MSISDN number shall be transferred in a delivery failure report to the SC.

In the abnormal end or in the provider error case the system failure error is provided to the SC.

The forward short message procedure is initiated when the GMSC has obtained the routing information needed to forward a mobile terminated short message to the servicing MSC or SGSN.

If both numbers MSC and SGSN are received from HLR as routing information, the SMS-GMSC may choose which path (SGSN or MSC) first the SMS is to be transferred.

If an LMSI has been provided in the MAP_SEND_ROUTING_INFO_FOR_SM confirmation, it can be included in the sm-RP-DA information field of the first MAP_MT_FORWARD_SHORT_MESSAGE request sent to the servicing MSC. In this case, the IMSI must be included in the Destination Reference of the MAP_OPEN request. If the LMSI is not sent by the SMS Gateway MSC, the sm-RP-DA information field in the first MAP_MT_FORWARD_SHORT_MESSAGE request sent to the servicing MSC or SGSN shall contain the IMSI and the Destination Reference in the MAP_OPEN request shall not be present. The Service Centre address is sent in the parameter SM_RP_OA. The More Messages To Send flag is set to TRUE or FALSE depending on the information received from the Service Centre.

If the GMSC is the servicing MSC then the MAP service is not initiated. The procedure in the Servicing MSC is described in subclause 23.3.1 and in the figure 23.3/4.

If the grouping of MAP_OPEN request and MAP_MT_FORWARD_SHORT_MESSAGE request together would need segmenting, these primitives must not be grouped together. The MAP_OPEN request primitive is sent first without any associated MAP service request primitive and the dialogue confirmation must be received before the MAP_MT_FORWARD_SHORT_MESSAGE request is sent.

As a response to the procedure, the GMSC will receive the MAP_MT_FORWARD_SHORT_MESSAGE confirmation indicating:

- a successful forwarding of the short message. This indication is passed to the SC;
- unsuccessful forwarding of the short message:

In case only one number (MSC or SGSN) was received from HLR as routing information, the mapping of the MAP error causes and the RP_ERROR causes is explained in GSM 03.40. The appropriate error indication is sent to the SC.

In case both numbers (MSC and SGSN) were received from HLR as routing information, the transfer of SMS is re-attempted towards the second path only when one of the following errors is received from the unsuccessful transfer over the first path:

Facility Not Supported

Unidentified Subscriber

Absent Subscriber with indication: GPRS or IMSI Detach

Unexpected Data Value

System failure

Data Missing

Subscriber Busy for MT SMS: GPRS Connection Suspended

otherwise, the mapping of the MAP error causes and the RP_ERROR causes is performed (see GSM 03.40) and the appropriate error indication is sent to the SC.

If second forwarding of short message is unsuccessful, the mapping of the MAP error causes and the RP_ERROR causes is explained in GSM 03.40. The appropriate error indications are sent to the SC.

If second forwarding of short message is successful, the successful indication is passed to the SC.

A provider error is indicated as a system failure error to the SC.

The GMSC invokes the procedure MAP_REPORT_SM_DELIVERY_STATUS, if:

- an absent subscriber_SM, an unidentified subscriber or SM delivery failure with error cause MS memory capacity exceeded indication is received from the serving MSC, SGSN or both, and
- one of the following conditions is satisfied:
 - the corresponding flags received in the MAP_INFORM_SC are not already set or the SC address is not yet included in the MWD set, or
 - the reason received from the serving MSC for failure to deliver the message is absent subscriber_SM, unidentified subscriber or SM delivery failure with error cause MS memory capacity exceeded, and the corresponding flag in the HLR (as indicated the information received in the MAP_INFORM_SERVICE CENTRE) is not set, or
 - the reason received from the serving MSC for failure to deliver the message is absent subscriber_SM and the absent subscriber diagnostic is different from the absent subscriber diagnostic received in the MAP_INFORM_SERVICE CENTRE.

If absent subscriber diagnostic information (see GSM 03.40) is included with the absent subscriber_SM error indication then this information is relayed to the HLR using the procedure MAP_REPORT_SM_DELIVERY_STATUS.

In case the SMS was attempted to be delivered towards the MSC and the SGSN, and both delivery failed with causes described above, the two unsuccessful SMS delivery outcomes for GPRS and non GPRS are sent to the HLR.

In case the SMS was attempted to be delivered towards the MSC and the SGSN, and the first delivery failed with causes described above and the second delivery succeeded, the unsuccessful and successful SMS delivery outcomes for GPRS and non GPRS are sent to HLR.

The gateway MSC may also invoke the procedure when the first SMS delivery was successful towards MSC, if the MNRF, MCEF flags or both were set in the HLR.

The gateway MSC may also invoke the procedure when the first SMS delivery was successful towards SGSN, if the MNRG, MCEF flags or both were set in the HLR.

This procedure is described in detail in subclause 23.5.

Unexpected data value, system failure errors are indicated as a system failure to the SC. Other errors are indicated using appropriate cause values and diagnostic information between the GMSC and the SC as described in GSM 03.40 and GSM 04.11.

The unidentified subscriber error is indicated to the SC as absent subscriber with diagnostic information set to 'Unidentified subscriber' as described in GSM 03.40.

Note that the indication, on which number belongs the SGSN and MSC, received from the HLR at routing information result (see subclause 23.3.3) will enable the GMSC to map the causes received from the SGSN, MSC or both into the appropriate causes for non GPRS, GPRS or both, and send them to the SC and HLR.

If there are more short messages to send in the Service Centre and the previous short message transfer succeeded, then the gateway MSC awaits the next short message.

When receiving the next short message from the SC, the gateway MSC sets the More Messages To Send flag according to the information received and starts the service MAP_MT_FORWARD_SHORT_MESSAGE again.

If the gateway MSC is the servicing MSC, then the short message transfer to mobile subscriber is started as described in the subclause 23.3.1.

The mobile terminated short message transfer procedure in the gateway MSC is shown in figure 23.3/7.

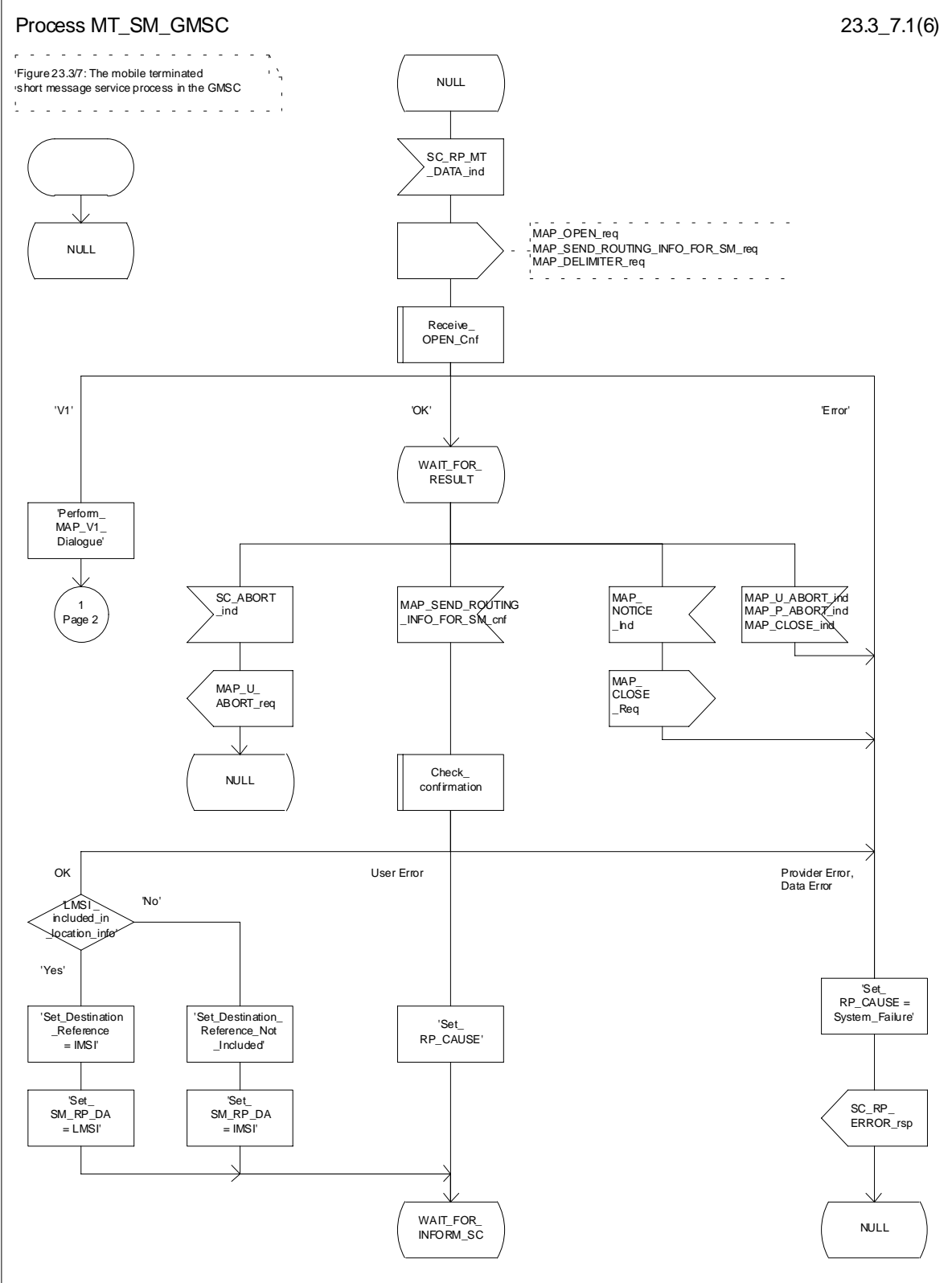


Figure 23.3/7 (sheet 1 of 6): Procedure MT_SM_GMSC

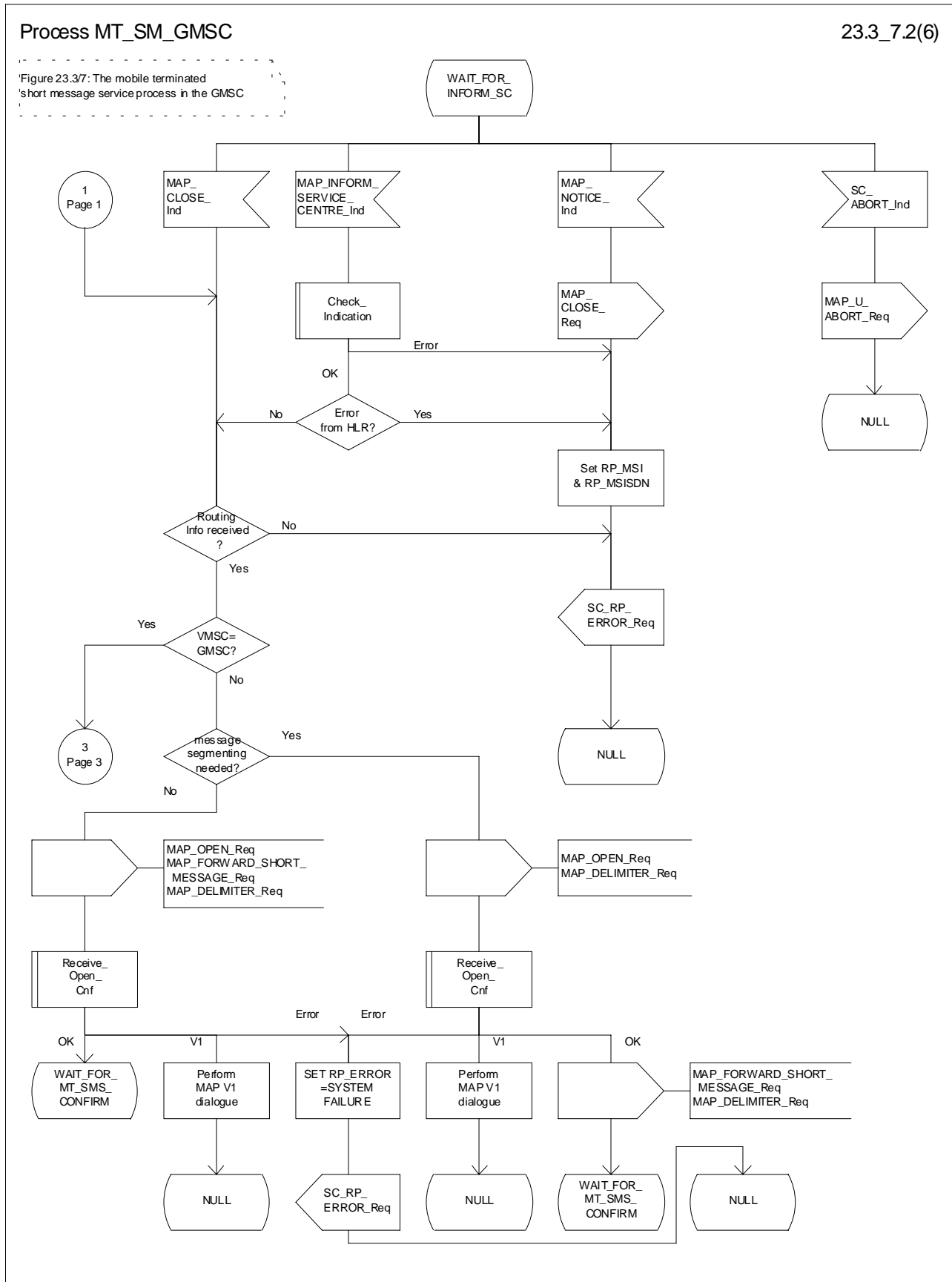
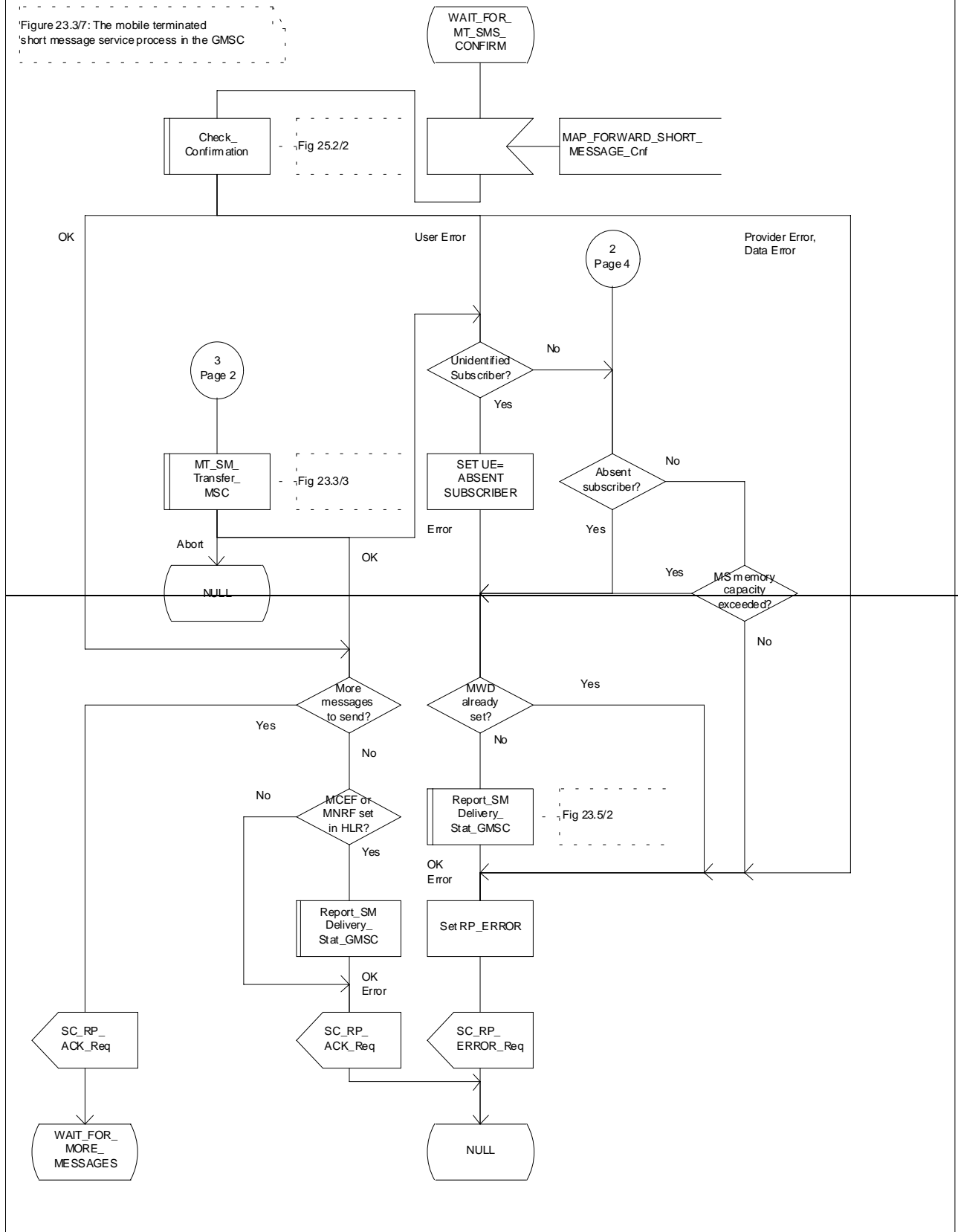


Figure 23.3/7 (sheet 2 to 6): Procedure MT_SM_GMSC

Process MT_SM_GMSC

23.3_7.3(6)

Figure 23.37: The mobile terminated short message service process in the GMSC



Process MT_SM_GMSC

23.3_7.3(6)

Figure 23.3/7: The mobile terminated short message service process in the GMSC

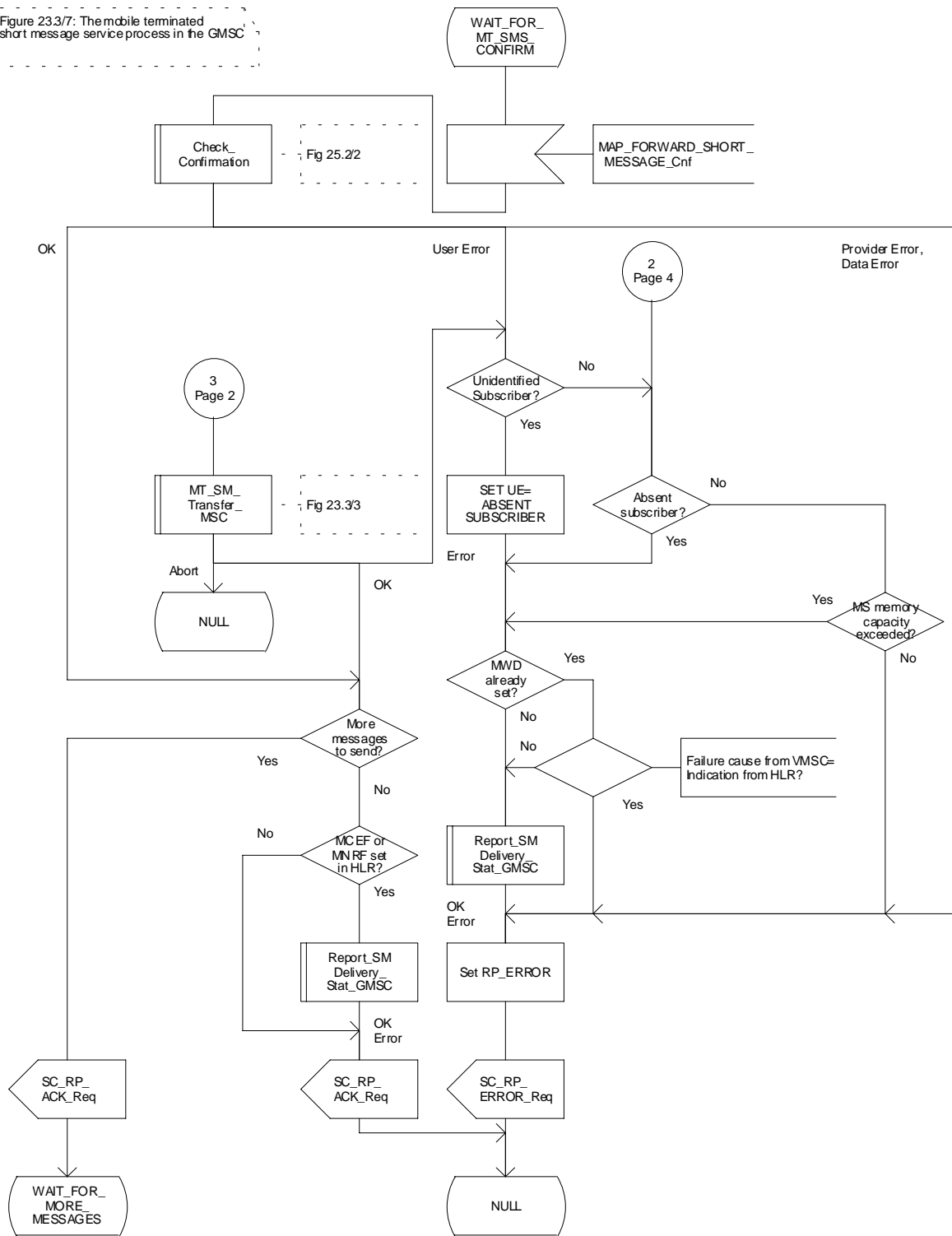


Figure 23.3/7 (sheet 3 of 6): Procedure MT_SM_GMSC

Process MT_SM_GMSC

23.3_7.4(6)

Figure 23.3/7: The mobile terminated short message service process in the GMSC

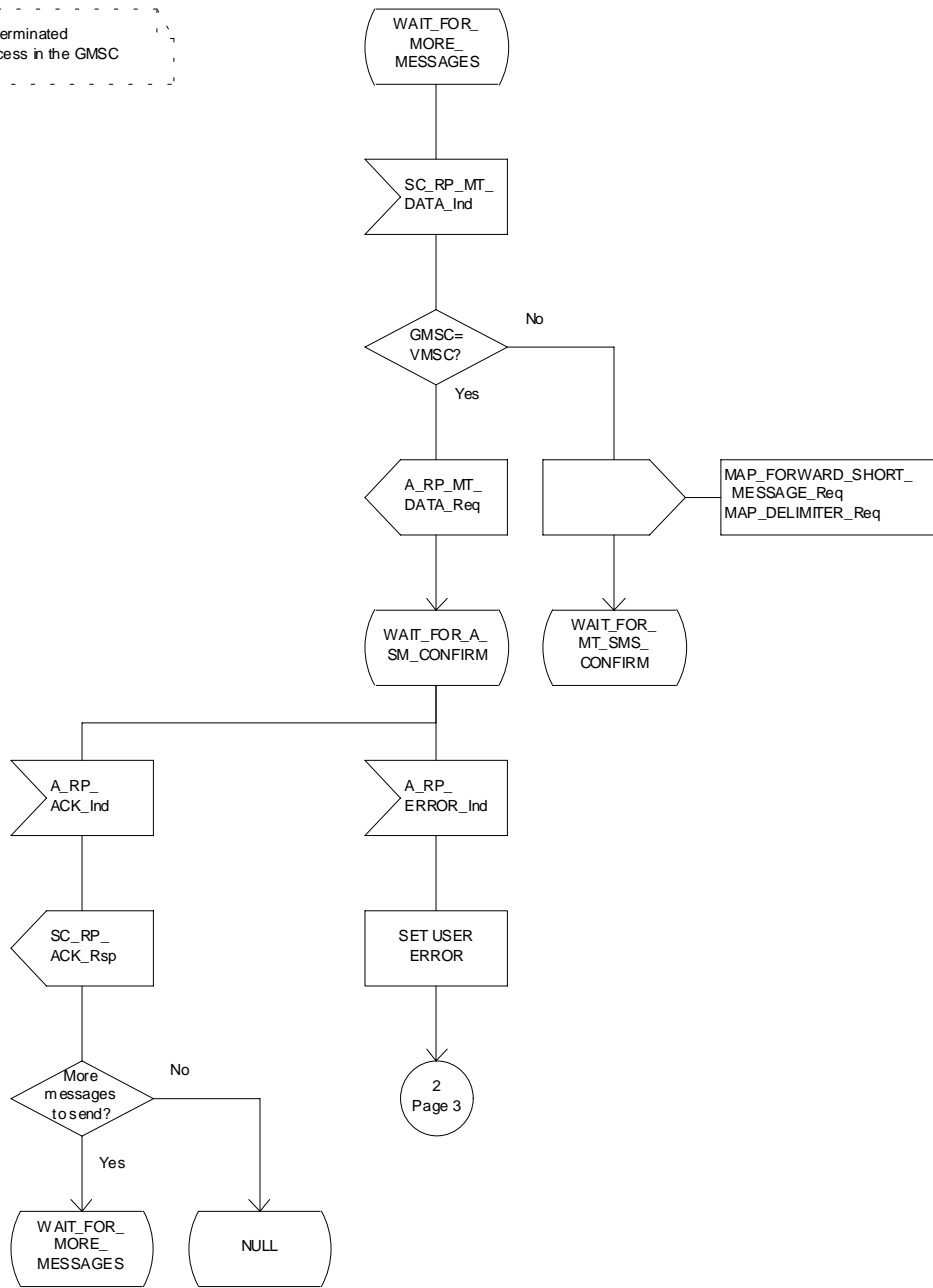


Figure 23.3/7 (sheet 4 of 6): Procedure_MT_SM_GMSC

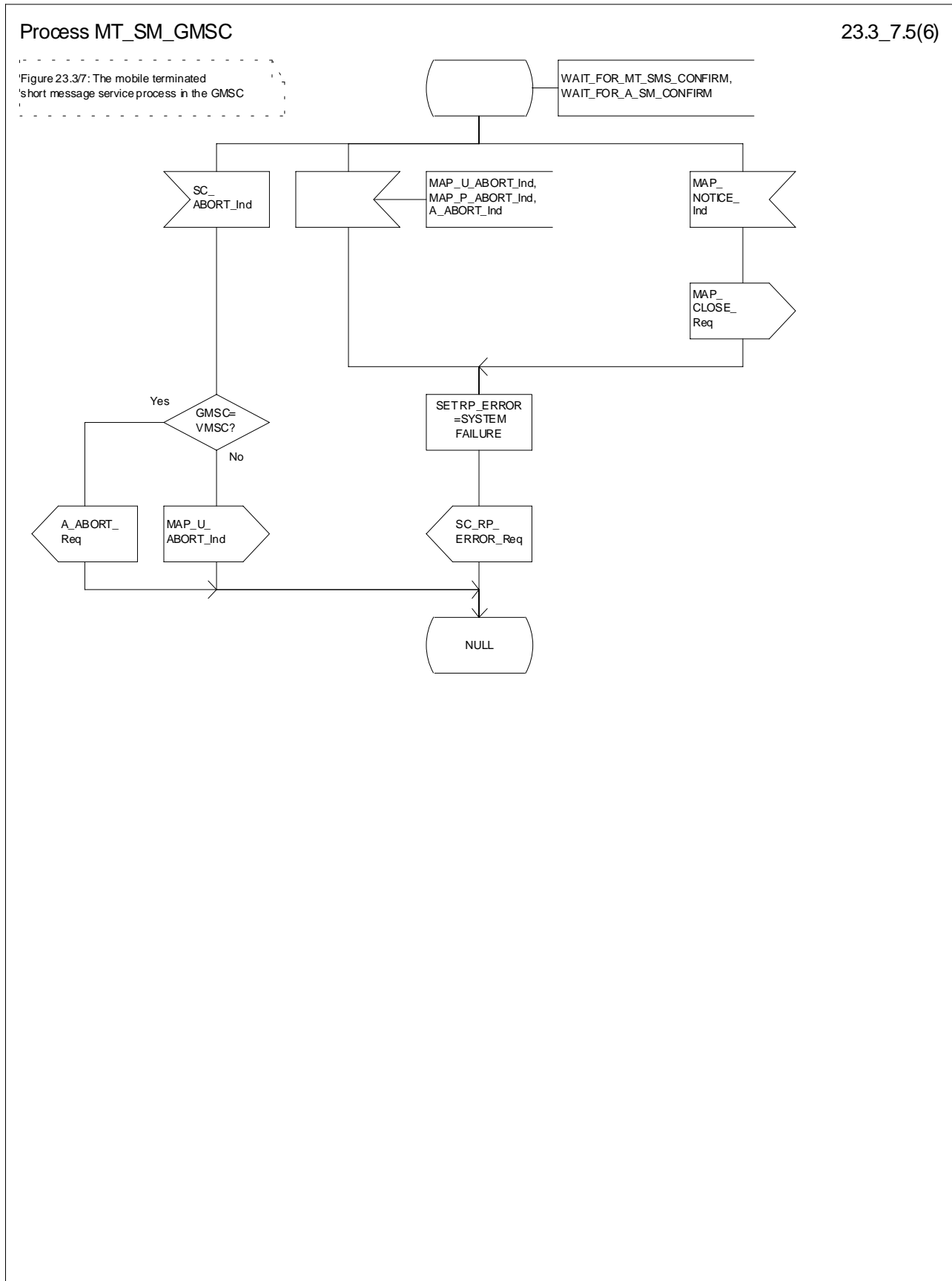


Figure 23.3/7 (sheet 5 to 6): Procedure MT_SM_GMSC

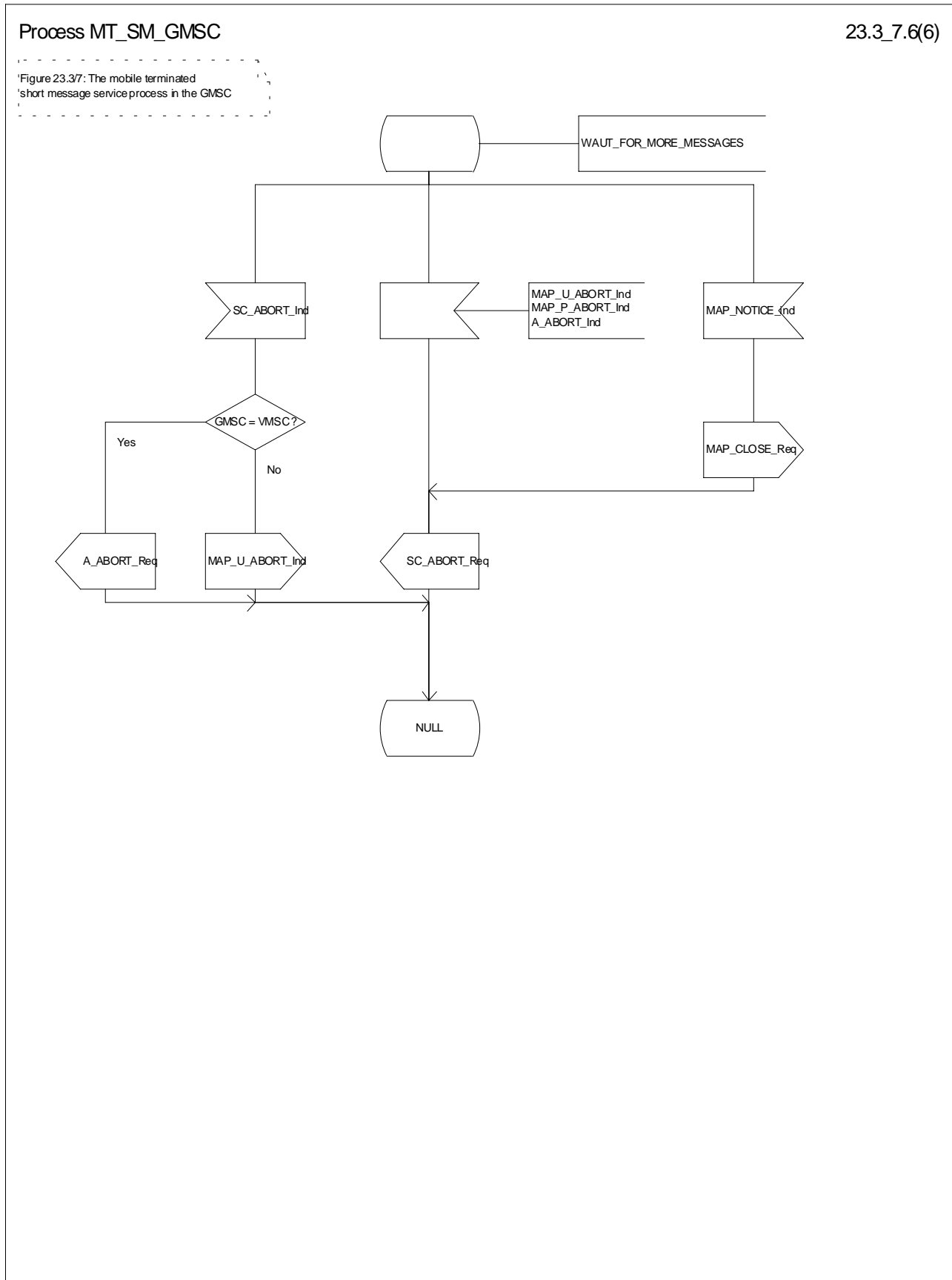


Figure 23.3/7 (sheet 6 of 6): Procedure MT_SM_GMSC

**** End of document ****

CHANGE REQUEST

⌘ **29.060 CR 255** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

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

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

| | | | |
|------------------------|---|-----------------|--|
| Title: | ⌘ Add APN.OI sub-field to the APN in PDP context IE | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ GTP enhancements | Date: | ⌘ 26 th September 2001 |
| Category: | ⌘ F Agreed by consensus | Release: | ⌘ REL-4 |
| | <p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p> | | <p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p> |

| | |
|--------------------------------------|---|
| Reason for change: | ⌘ In case that the MS has been moved from the other SGSN with PDP contexts active and independently of this, the ISD arrives from the HLR to the serving SGSN to change the his/her subscriber data to mark up 'VPLMN Address Allowed' inactive. Since the NI (Network Identifier) part of APN is only transferred from the old SGSN during the SRNS relocation procedure and RA Update procedure, there is no way for the serving SGSN to make a judgement whether current active PDP contexts that relocated from the old SGSN should be deleted or not. |
| Summary of change: | ⌘ Add APN.OI part to the APN sub-field in PDP context IE. This change enables the serving SGSN to know whether the connected IP address resides in the HPLMN or VPLMN. |
| Consequences if not approved: | ⌘ The ISD to change the 'VPLMN Address Allowed' may not properly work to the active PDP contexts under the condition described above. |

| | | | |
|------------------------------|---|---|--|
| Clauses affected: | ⌘ 7.7.29 | | |
| Other specs affected: | <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications | ⌘ | |
| Other comments: | ⌘ | | |

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

7.7.29 PDP Context

The PDP Context information element contains the Session Management parameters, defined for an external packet data network address, that are necessary to transfer between SGSNs at the Inter SGSN Routing Area Update procedure.

NSAPI is an integer value in the range [0; 15].

The NSAPI points out the affected PDP context.

The SAPI indicates the LLC SAPI that is associated with the NSAPI.

The Transaction Identifier is the 4 or 12 bit Transaction Identifier used in the 3GPP TS 24.008 Session Management messages which control this PDP Context. If the length of the Transaction Identifier is 4 bit, the second octet shall be set to all zeros. The encoding is defined in 3GPP TS 24.007. The latest Transaction Identifier sent from SGSN to MS is stored in the PDP context IE.

Reordering Required (Order) indicates whether the SGSN shall reorder T-PDUs before delivering the T-PDUs to the MS. When the Quality of Service Negotiated (QoS Neg) is Release 99, the Reordering Required (Order) shall be ignored by receiving entity.

The VPLMN Address Allowed (VAA) indicates whether the MS is allowed to use the APN in the domain of the HPLMN only or additionally the APN in the domain of the VPLMN.

The QoS Sub Length, QoS Req Length and QoS Neg Length represent respectively the lengths of the QoS Sub, QoS Req and QoS Neg fields, excluding the QoS Length octet.

The Quality of Service Subscribed (QoS Sub), Quality of Service Requested (QoS Req) and Quality of Service Negotiated (QoS Neg) are encoded as described in section 'Quality of Service (QoS) Profile'. Their minimum length is 4 octets; their maximum length may be 255 octets.

The Sequence Number Down is the number of the next T-PDU that shall be sent from the new SGSN to the MS. The number is associated to the Sequence Number from the GTP Header of an encapsulated T-PDU.

The Sequence Number Up is the number that new SGSN shall use as the Sequence Number in the GTP Header for the next encapsulated T-PDU from the MS to the GGSN.

The Send N-PDU Number is used only when acknowledged peer-to-peer LLC operation is used for the PDP context. Send N-PDU Number is the N-PDU number to be assigned by SNDCP to the next down link N-PDU received from the GGSN. It shall be set to 255 if unacknowledged peer-to-peer LLC operation is used for the PDP context.

The Receive N-PDU Number is used only when acknowledged peer-to-peer LLC operation is used for the PDP context. The Receive N-PDU Number is the N-PDU number expected by SNDCP from the next up link N-PDU to be received from the MS. It shall be set to 255 if unacknowledged peer-to-peer LLC operation is used for the PDP context.

The Uplink Tunnel Endpoint Identifier Control Plane is the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in up link direction for control plane purpose. It shall be used by the new SGSN within the GTP header of the Update PDP Context Request message.

The GGSN Address for User Traffic and the Uplink Tunnel Endpoint Identifier Data I are the GGSN address and the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in uplink direction for user plane traffic on a PDP context. They shall be used by the new SGSN to send uplink user plane PDU to the GGSN

The PDP Context Identifier is used to identify a PDP context for the subscriber.

The PDP Type Organisation and PDP Type Number are encoded as in the End User Address information element.

The PDP Address Length represents the length of the PDP Address field, excluding the PDP Address Length octet.

The PDP Address is an octet array with a format dependent on the PDP Type. The PDP Address is encoded as in the End User Address information element if the PDP Type is IPv4 or IPv6.

The GGSN Address Length represents the length of the GGSN Address field, excluding the GGSN Address Length octet.

The old SGSN includes the GGSN Address for control plane that it has received from GGSN at PDP context activation or update.

The APN is the Access Point Name in use in the old SGSN. ~~The APN field shall be composed of the APN Network Identifier part and the APN Operator Identifier part sent in the Create PDP Context request message.~~

The spare bits x indicate unused bits that shall be set to 0 by the sending side and which shall not be evaluated by the receiving side.

| | | | | | |
|-----------------|---|-----|-------------------|------------------------|-------|
| 1 | Type = 130 (Decimal) | | | | |
| 2-3 | Length | | | | |
| 4 | Res- erved | VAA | Res- erve d | Ord er | NSAPI |
| 5 | X | X | X | X | SAPI |
| 6 | QoS Sub Length | | | | |
| 7 - (q+6) | QoS Sub [4..255] | | | | |
| q+7 | QoS Req Length | | | | |
| (q+8)-(2q+7) | QoS Req [4..255] | | | | |
| 2q+8 | QoS Neg. Length | | | | |
| (2q+9)-(3q+8) | QoS Neg [4..255] | | | | |
| (3q+9)-(3q+10) | Sequence Number Down (SND) ¹⁾ | | | | |
| (3q+11)-(3q+12) | Sequence Number Up (SNU) ¹⁾ | | | | |
| 3q+13 | Send N-PDU Number ¹⁾ | | | | |
| 3q+14 | Receive N-PDU Number ¹⁾ | | | | |
| (3q+15)-(3q+18) | Uplink Tunnel Endpoint Identifier Control Plane | | | | |
| (3q+19)-(3q+22) | Uplink Tunnel Endpoint Identifier Data I | | | | |
| 3q+23 | PDP Context Identifier | | | | |
| 3q+24 | Spare 1 1 1 1 | | | PDP Type Organisation | |
| 3q+25 | PDP Type Number | | | | |
| 3q+26 | PDP Address Length | | | | |
| (3q+27)-m | PDP Address [1..63] | | | | |
| m+1 | GGSN Address for control plane Length | | | | |
| (m+2)-n | GGSN Address for control plane [4..16] | | | | |
| n+1 | GGSN Address for User Traffic Length | | | | |
| (n+2)-o | GGSN Address for User Traffic [4..16] | | | | |
| o+1 | APN length | | | | |
| (o+2)-p | APN | | | | |
| p+1 | Spare (sent as 0 0 0 0) | | | Transaction Identifier | |
| p+2 | Transaction Identifier | | | | |

Figure 43: PDP Context Information Element

CHANGE REQUEST

⌘ **29.060 CR 264** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

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

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

| | | | |
|------------------------|--|-----------------|---|
| Title: | ⌘ Clarification of header marker setting for Error Indication | | |
| Source: | ⌘ CN4 | | |
| Work item code: | ⌘ TEI4 | Date: | ⌘ 19 th September 2001 |
| Category: | ⌘ F Agreed by consensus | Release: | ⌘ REL-4 |
| | <i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. | | <i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5) |

| | |
|--------------------------------------|--|
| Reason for change: | ⌘ When transporting an Error Indication message, the 'S' field in the GTP-U header should be set to 1 (even though the sequence number is ignored) since this is a signalling message. This is not reflected in the definition of the 'S' field. |
| Summary of change: | ⌘ Add text to clarify 'S' field for Error Indication messages |
| Consequences if not approved: | ⌘ Incorrect header settings and confusion over implementation of error indication messages. |

| | | | |
|------------------------------|---|---|--|
| Clauses affected: | ⌘ 9.3.1 | | |
| Other specs affected: | <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications | ⌘ | |
| Other comments: | ⌘ | | |

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

9.3.1 Usage of the GTP-U Header

The GTP-U header shall be used as follows:

- Version shall be set to decimal 1 ('001').
- Protocol Type (PT) shall be set to '1'.
- If the S field is set to '1' the sequence number field is present otherwise it is set to '0'. For GTP-U messages Echo Request, Echo Response, Error Indication and Supported Extension Headers Notification, the S field shall be set to '1'.