3GPP TSG CN Plenary Meeting #21 **NP-030366**
17th - 19th September 2003. Frankfurt, Germany.

Source: TSG CN WG2

Title: CRs on Rel-5 Work Item CAMEL4

Agenda item: 8.3

Document for: APPROVAL

Introduction:

This document contains 3 CRs on **Rel-5 Work Item CAMEL4.** These CRs have been agreed by TSG CN WG2 and are forwarded to TSG CN Plenary meeting for approval.

WG_tdoc	Title	Spec	CR	Rev	Cat	Rel	C_Ver
N2-030338	Correction to SMS Event Disarming	23.078	603		F	Rel-5	5.4.0
N2-030462	Usage of Alphanumeric Characters in SMS Address Fields	29.078	328	1	F	Rel-5	5.4.0
N2-030463	Correction to SMS Error handling	23.078	604	1	F	Rel-5	5.4.0

3GPP TSG CN WG2 Meeting #30 **N2-030338**
Sophia Antipolis, France, 25th – 29th August 2003

CHANGE REQUEST

⌘ **23.078** **CR** **603** ⌘**rev** ⌘ Current version: **5.4.0** ⌘

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to SMS Event Disarming
Source:	⌘	Ericsson
Work item code:	⌘	CAMEL4
Date:	⌘	14 August 2003
Category:	⌘	F (essential correction)
Release:	⌘	Rel-5

Use one 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)*

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change: ⌘

When process SMS_SSF receives an indication from the MSC or SGSN about the successful or unsuccessful submission or delivery of an SMS, then the smsSSF applies implicit disarming of detection points. Refer to figure 7.15-7: Process SMS_SSF (sheet 7).

The implicit disarming implies that the event "***which did not occur***" is disarmed. The event which occurred, is, however, not disarmed.

If the event which occurred is armed as EDP-N or is not armed, then the SDL indicates that the smsSMS FSM shall transit to the state Idle.

If the event which occurred is armed as EDP-R, then the smsSSF FSM transits to the state Waiting for Instructions. When the smsSSF then subsequently receives CAP ContinueSMS, then the smsSSF FSM shall transit to the state Idle.

However, the fact that the event which occurred was neither explicitly nor implicitly disarmed at the moment that the event was reported (refer figure 7.15-7) may lead to confusion for implementors. Is the event still armed or not? In other words, shall the smsSSF wait for an explicit instruction from the gsmSCF to disarm the event, before the smsSSF FSM can transit to state Idle?

The reason why the event which occurred is not disarmed on sheet 7 (in the task box immediately following the input signal from the MSC or SGSN) is that the arming state of the event is still required to establish whether and how the event shall be reported to the gsmSCF.

However, in the case of EDP-R arming, the event may be disarmed after the smsSSF has reported the occurrence of the event. The event is not needed anymore; disarming the event would then ensure that the smsSSF FSM transits

	to the Idle state when it receives the following CAP ContinueSMS. Section 7.5.5.1 specifies that in the case of successful or unsuccessful SMS submission or delivery, ***both*** events (i.e. both MO-SMS evebts or both MT-SMS events) shall be disarmed. This is currently not reflected in the SDL. The present CR proposes a correction in this regard. When the event is disarmed after occurrence thereof, the gsmSCF still has the possibility to use FurnishChargingInformationSMS (section 12.4.2.1, precondition: smsSSF FSM is in state WFI). The gsmSCF is not allowed to send ReleaseSMS at this point of SMS processing (section 12.6.2.1, precondition (b): The FSM is in DP SMS_Collected_Info or in DP SMS_Delivery_Requested).
Summary of change: ⌘	Improve sheet 7 of process SMS_SSF as explained above.
Consequences if not approved: ⌘	Ambiguity for designers; - smsSSF may expect an explicit event disarming instruction, before transiting to Idle; if this instruction does not arrive, the smsSSF would hang; - gsmSCF may unnecessarily send an event disarming instruction before sending CAP ContinueSMS.

Clauses affected:	⌘	7.5.5			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Refer to the highlighted text in section 7.5.5.1.			

*** *First Modification* ***

7.5.5 Handling of mobile originating and mobile terminating SMS in the gsmSSF or gprsSSF

7.5.5.1 Process SMS_SSF

Sheet 1 The Int_Invoke SMS_SSF signal dictates which TDP shall be armed. For a Mobile Originated SMS service, the SMS_Collected_Info TDP shall be armed. For a Mobile Terminated SMS service, the SMS_Delivery_Request TDP shall be armed.

Sheet 2 The Int_SMS_Failure signal may be received only for a MO-SMS service. It is received when a MS detach event occurs before the SMS_SSF is invoked.

Sheet 3 The SMSC Address and Destination Subscriber Number may be received in CAP ConnectSMS only for a MO-SMS service.

Sheet 4: For a MO-SMS service, the following events may be armed or disarmed: O_SMS_Submission, O_SMS_Failure. For a MT-SMS service, the following events may be armed or disarmed: T_SMS_Delivery, T_SMS_Failure.

Sheet 5: For a MO-SMS service, the gsmSCF may place free-format charging data in the 'MOSMSRecord' CDR (in the MSC) or in the S-SMO-CDR (in the SGSN).

For a MT-SMS service, the gsmSCF may place free-format charging data in the 'MTSMSRecord' (in the MSC) or in the S-SMT-CDR (in the SGSN).

Refer to 3GPP TS 32.005 [**Error! Reference source not found.**] and 3GPP TS 32.015 [**Error! Reference source not found.**] for a description of these CDR types.

Sheet 6: The Int_SMS_Failure signal in state Waiting_For_Instructions may be received for a MO-SMS service only. It is received when a MS detach event occurs before the gsmSCF has given instruction to continue SM processing.

Sheet 7: When the SM submission or failure event occurs, both MO-SMS events shall be disarmed.

When the SM delivery or failure event occurs, both MT-SMS events shall be disarmed.

7.5.5.2 Process Complete_SMS_FCI_Record

Sheet 1: For a MO-SMS service, the 'MOSMSRecord' or 'S-SMO-CDR' shall be closed. For a MT-SMS service, the 'MTSMSRecord' or 'S-SMT-CDR' shall be closed.

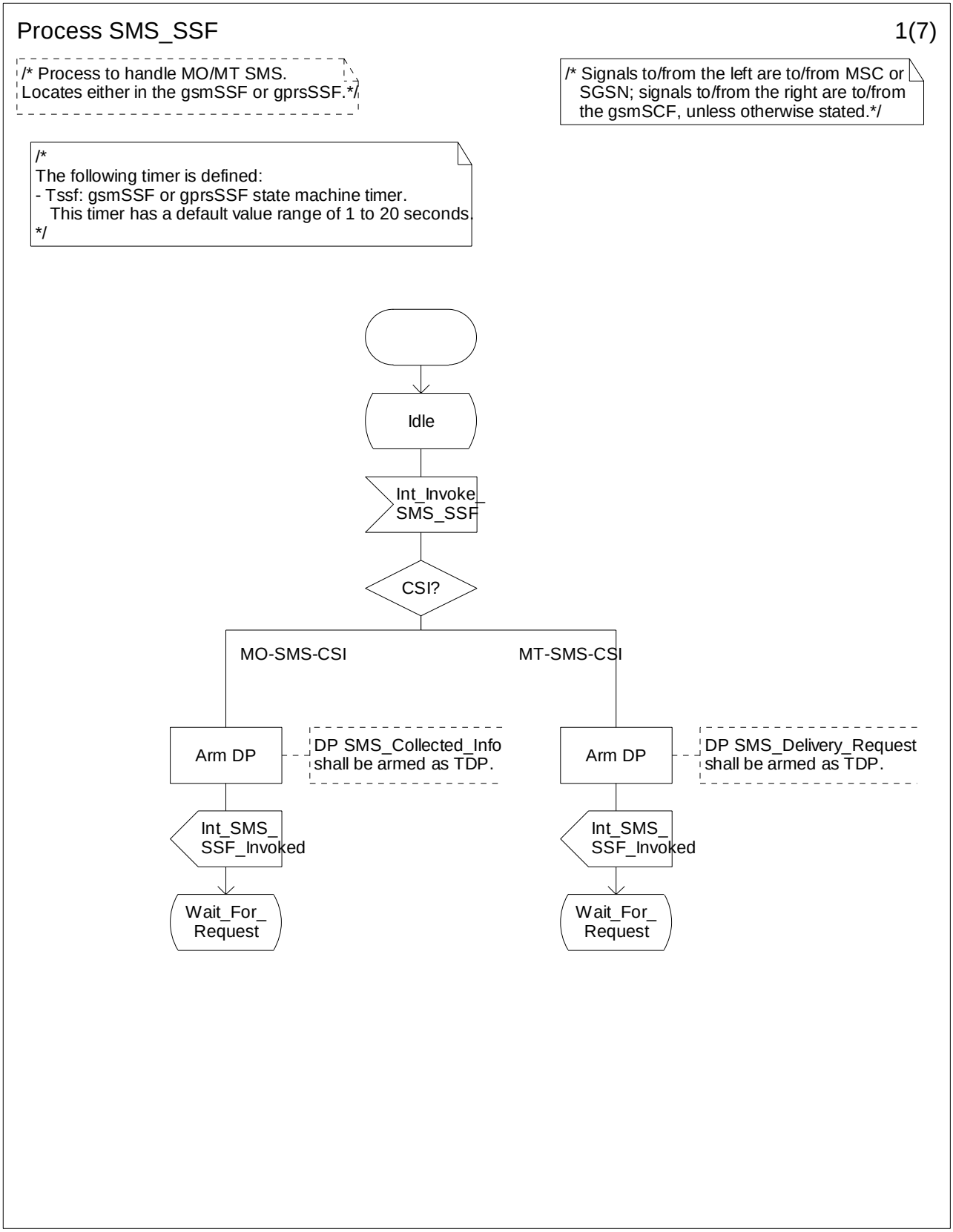


Figure Error! Reference source not found..**1-1: Process SMS_SSF (sheet 1)**

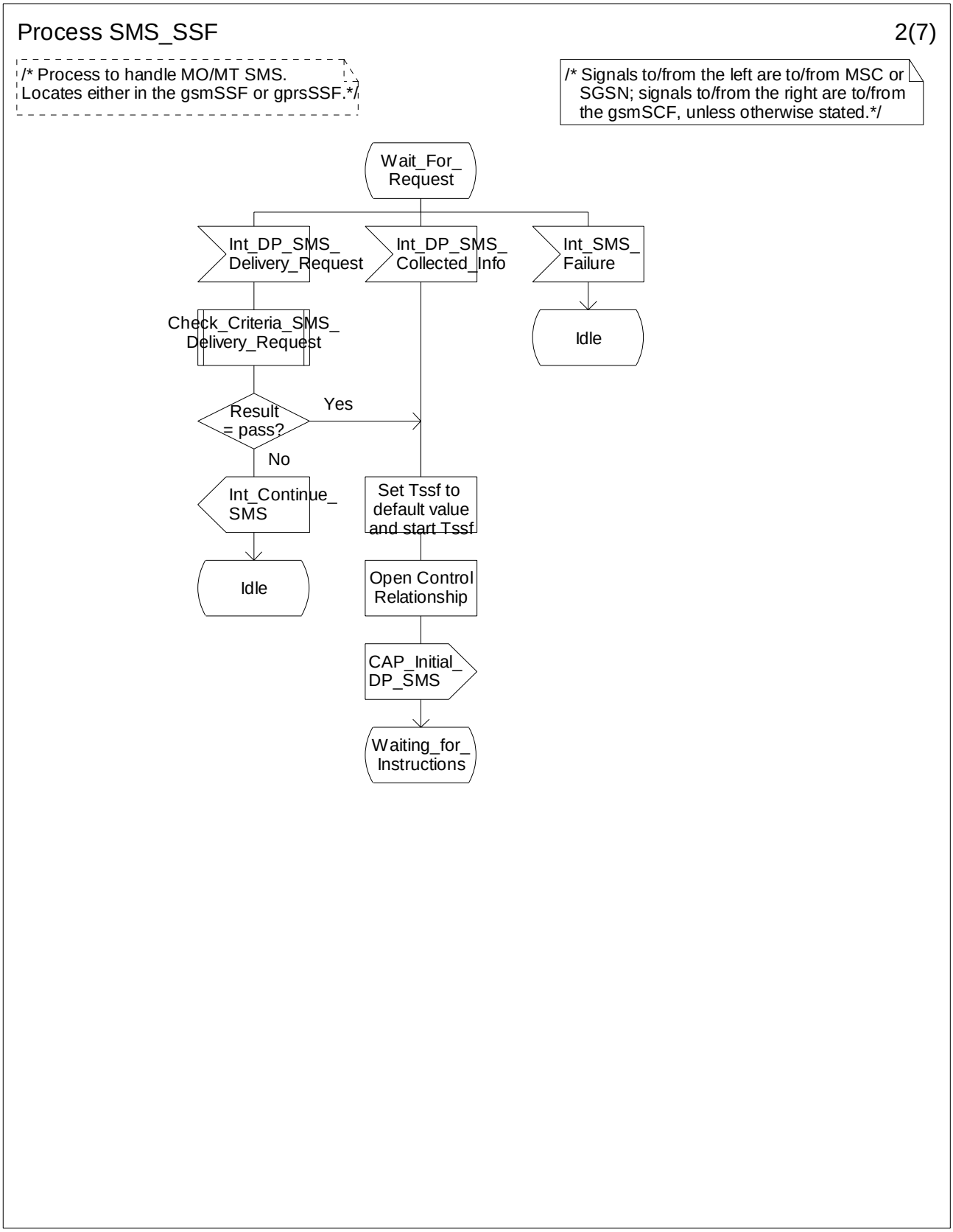


Figure Error! Reference source not found..1**-2: Process SMS_SSF (sheet 2)**

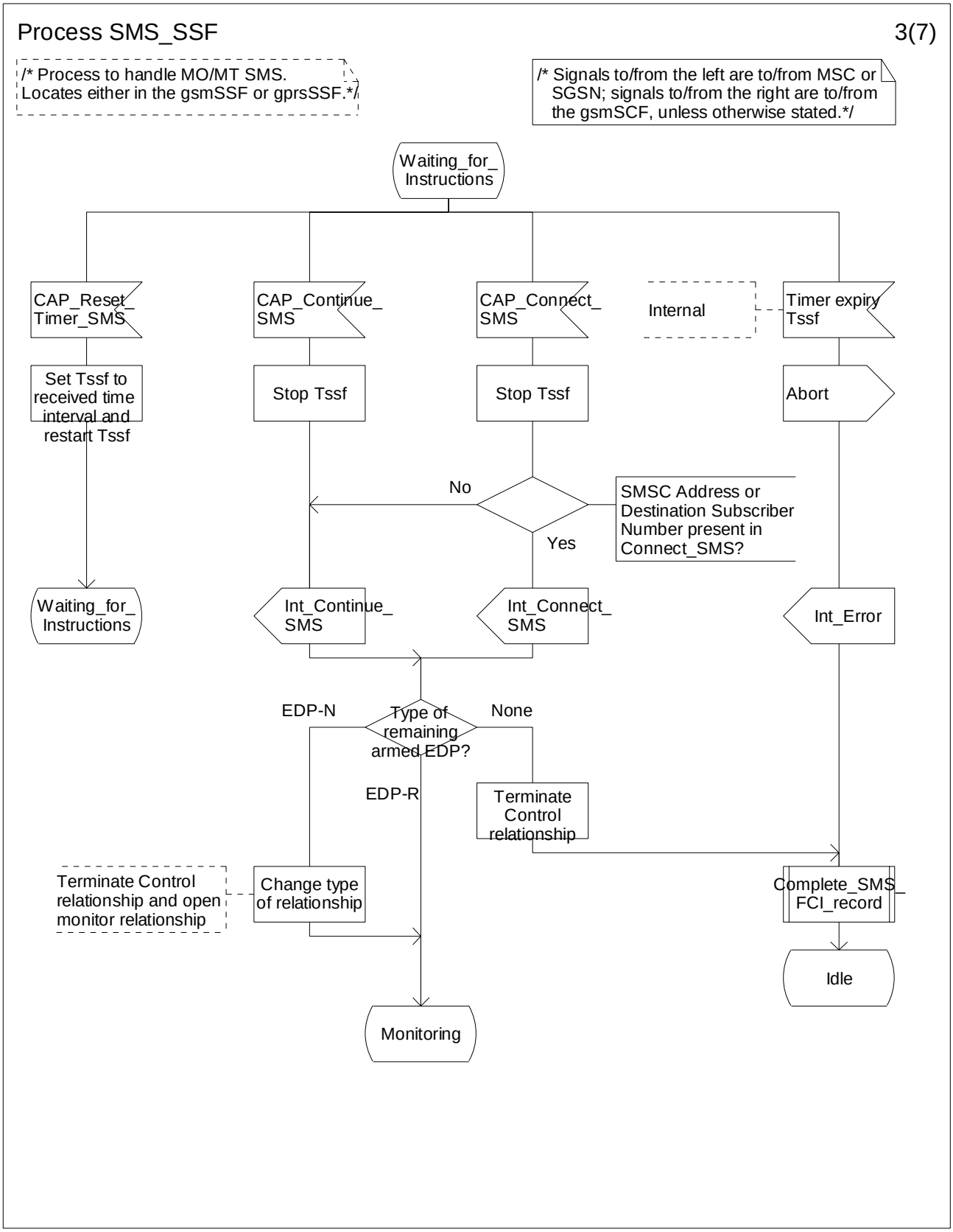


Figure Error! Reference source not found..1**-3: Process SMS_SSF (sheet 3)**

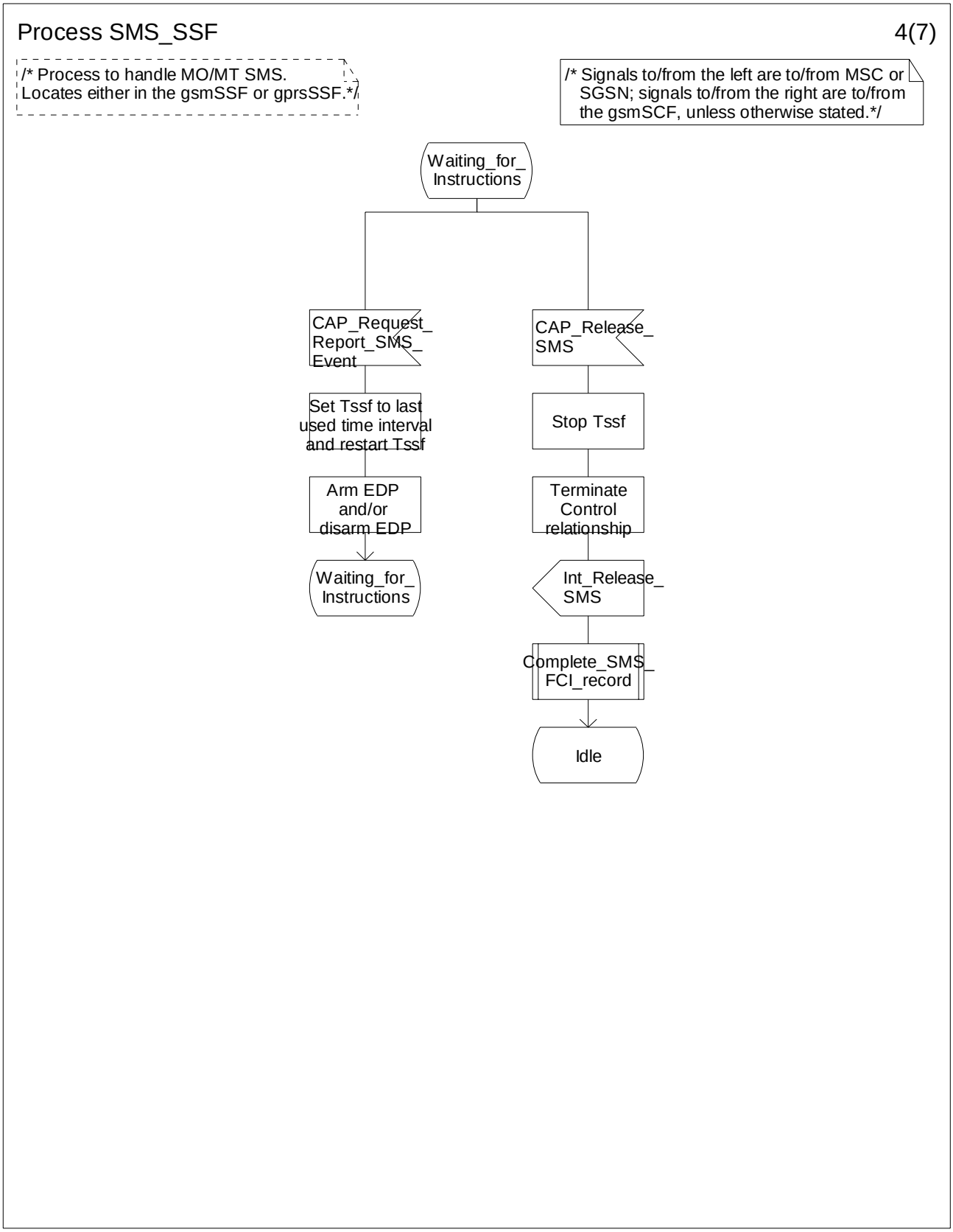


Figure Error! Reference source not found..1**-4: Process SMS_SSF (sheet 4)**

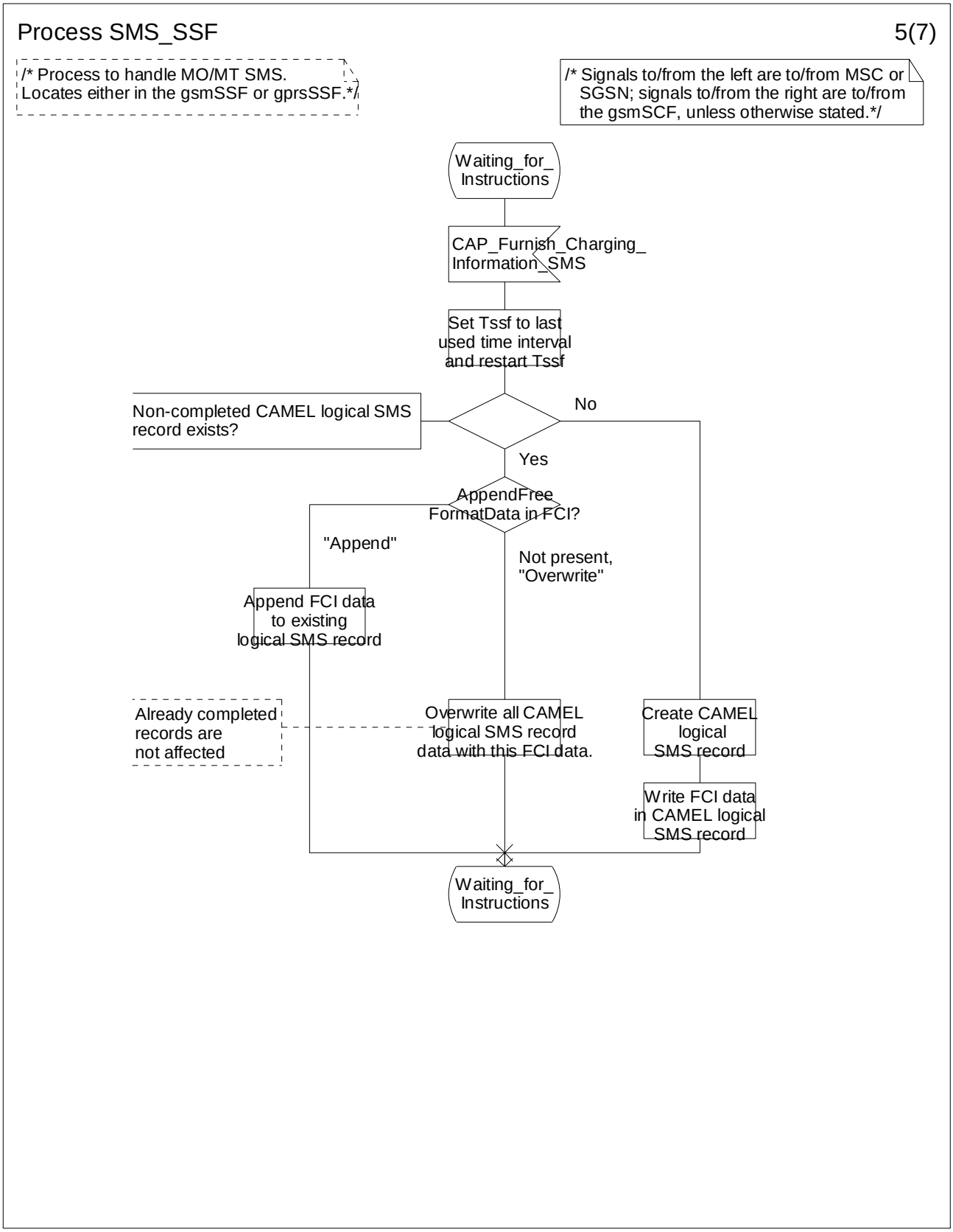


Figure Error! Reference source not found..1**-5: Process SMS_SSF (sheet 5)**

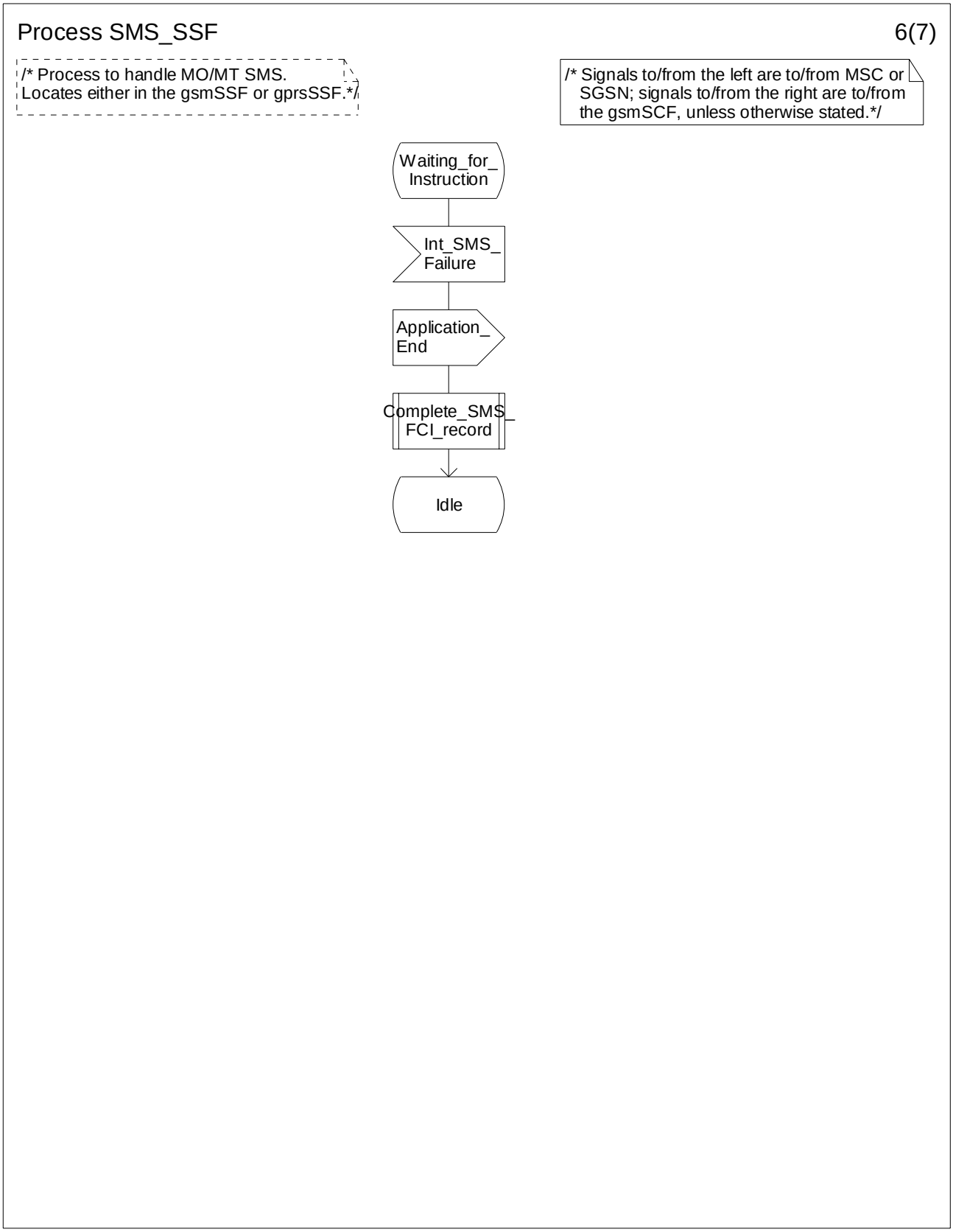
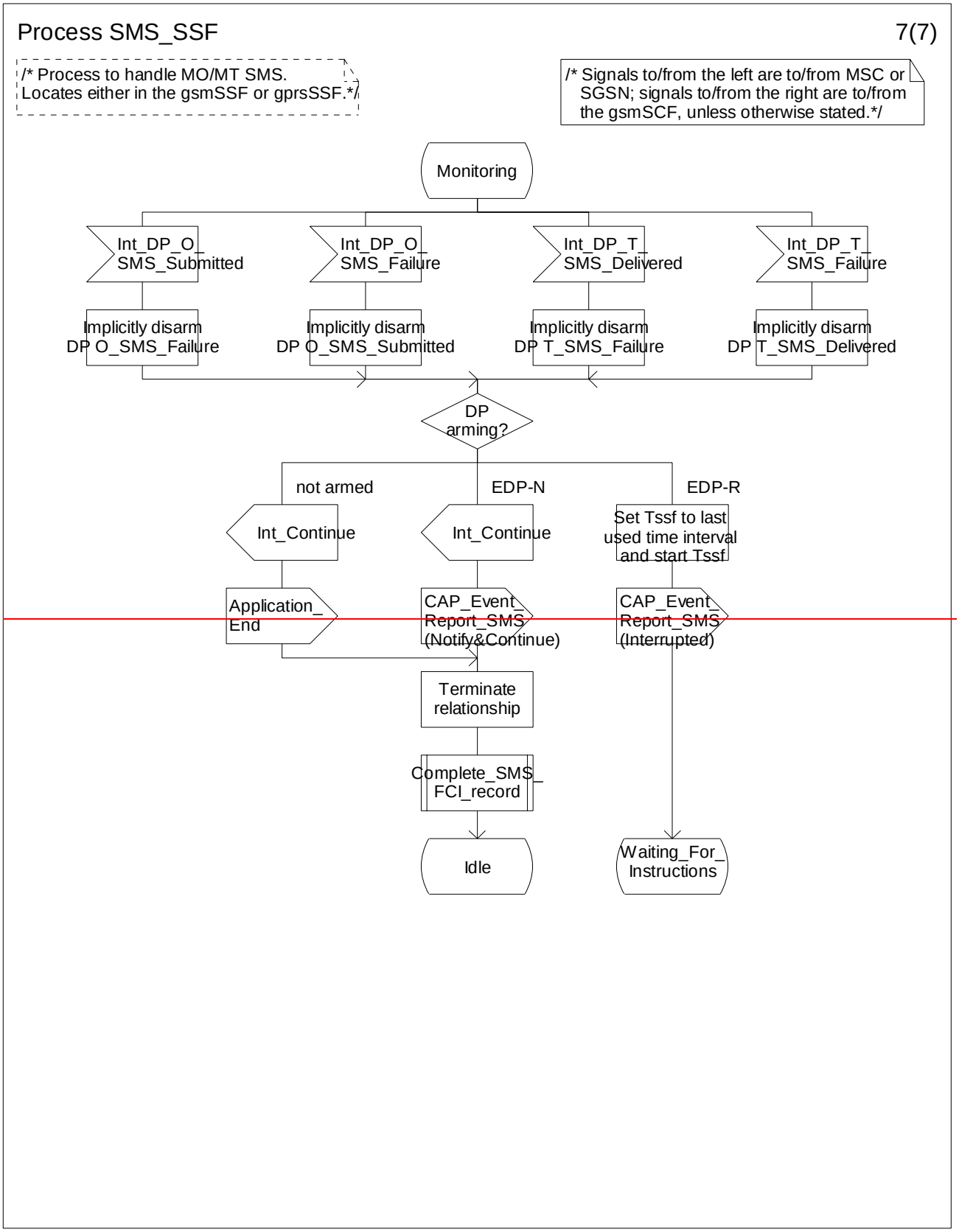


Figure Error! Reference source not found..1**-6: Process SMS_SSF (sheet 6)**



~~Figure 7.15-7: Process SMS_SSF (sheet 7)~~

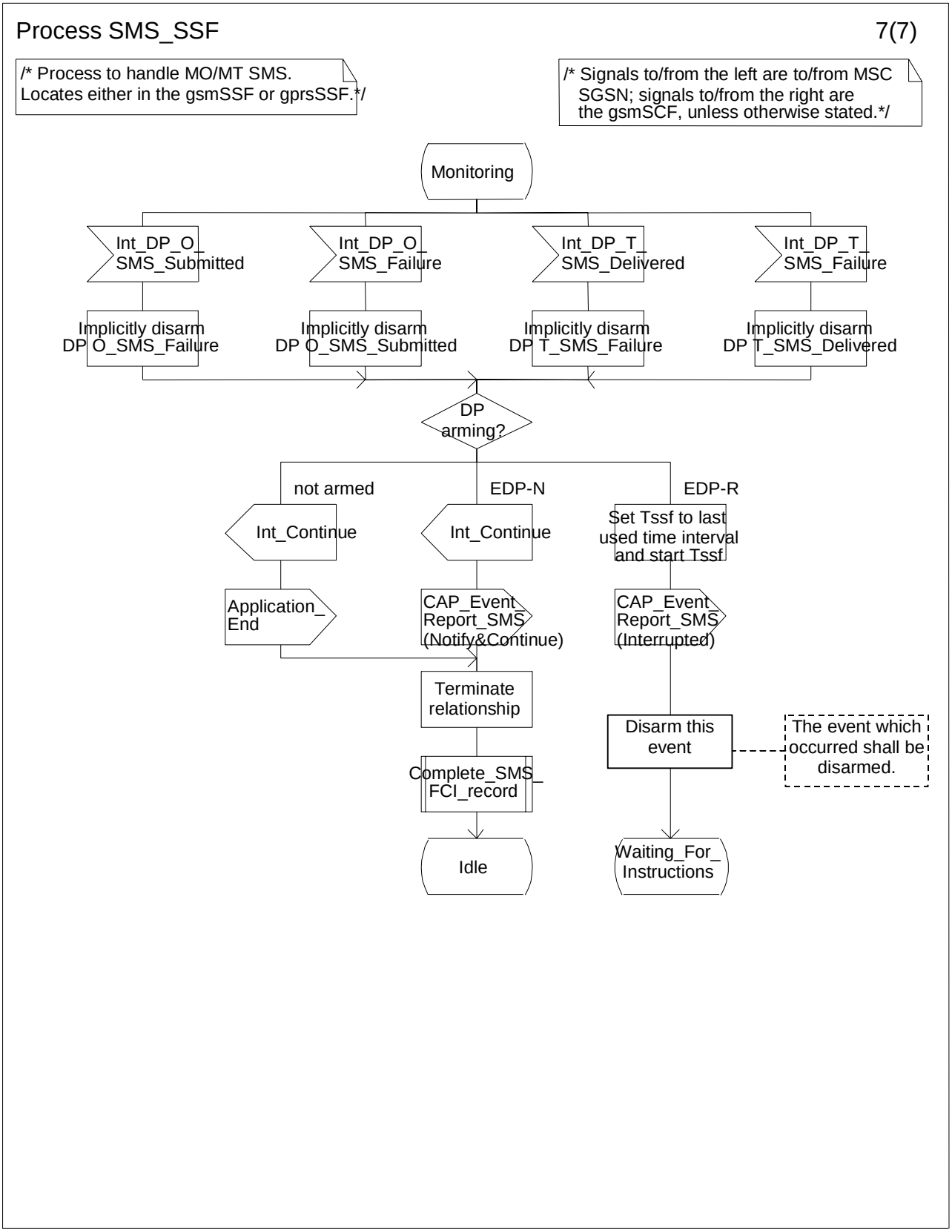


Figure Error! **Reference source not found..1**-8: Process SMS_SSF (sheet 7)

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3GPP TSG CN WG2 Meeting #30
Sophia Antipolis, France, 25th – 29th August 2003

N2-030462
(N2-030365 rev)

CR-Form-v7

CHANGE REQUEST

⌘ **29.078** **CR** **328** ⌘ **rev** **1** ⌘ Current version: **5.4.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Usage of Alphanumeric Characters in SMS Address Fields
Source:	⌘	T-Mobile
Work item code:	⌘	CAMEL4
Date:	⌘	28/08/2003
Category:	⌘	**F (essential correction)**
Release:	⌘	Rel-5

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change:	⌘	29.078 defines that the DestinationSubscriberNumber parameter (e.g. in InitialDPSMS) is a CalledPartyBCDNumber. For encoding of the CalledPartyBCDNumber, 29.078 refers to 24.008. According to 24.008, the content of a CalledPartyBCDNumber can be digits 0-9, *, #, a, b, c. However, in chapter 7.6.1.2, 23.078 states that the "Destination Subscriber Number shall be retrieved from the TP-Destination-Address in the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU." According to 23.040 (sections 9.2.3.8 and 9.1.2.5), for the TP-Destination-Adress field either a semi-octet or an alphanumeric (7-bit) representation applies. For the semi-octet representation there is again a reference to 24.008 (CalledPartyBCDNumber), which is o.k. However, for the alphanumeric representation, there is a reference to the GSM 7-bit default alphabet from 23.038. In this case, the complete alphabet (0-9, a-z, ...) is allowed. This contradicts the ASN.1 definition of the DestinationSubscriberNumber in 29.078. The same argument as above also holds for the CallingParty(s)Number parameter.
Summary of change:	⌘	Text is added to the description of the respective parameters, explaining that the complete set of alphanumeric characters (7-bit default alphabet as defined in 23.038) may be used for the callingParty(s)Number and the destination-SubscriberNumber in the operations InitialDPSMS and ConnectSMS.
Consequences if not approved:	⌘	Confusion and misinterpretation. From the ASN.1 definition, an SCP implementor could expect, that only numbers/digits can be received in the CallingParty(s)-Number and DestinationSubscriberNumber parameters in the SMS-related operations. This could lead to serious misoperation, if alphanumeric characters

	are used in these address fields.

Clauses affected:	⌘	2, 12.1.1.1, 12.5.1.1			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Question: Is there a reason for the different parameter names callingPartysNumber in ConnectSMS and callingPartyNumber in InitialDPSMS?			

— For Information Only: 23.078, Description of InitialDP_SMS, Connect_SMS (excerpt) —

7.6.1.2 Initial DP SMS

7.6.1.2.1 Description

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

7.6.1.2.2 Information Elements

Information element name	MO	MT	Description
Destination Subscriber Number	M	-	This IE contains a number to identify the Destination short message entity. The Destination Subscriber Number shall be retrieved from the TP-Destination-Address in the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU.
Called Party Number	-	M	This IE contains a number to identify the subscriber for whom the Short Message is destined. The Called Party Number shall be the MSISDN of the served subscriber.
Calling Party Number	M	C	For MO SMS: This IE contains a number to identify the subscriber who requests the SM submission. The Calling Party Number shall be the MSISDN of the served subscriber. For MT SMS: This IE contains the address of the submitter of the short message. For SMS-DELIVER TPDU, the Calling Party Number shall be retrieved from the TP-Originating-Address in the SMS-DELIVER TPDU. For SMS-STATUS-REPORT TPDU, this element shall not be included in this IF.
SMSC Address	M	M	For MO SMS: This IE defines the address of the SMSC to which the MO short message is intended to be submitted. It shall be retrieved from the RP-Destination-Address in the RP-MO-DATA RPDU. For MT SMS: This IE identifies the address of the SMSC from which the MT short message is originating. It shall be retrieved from the RP-Originating-Address in the RP-MT-DATA RPDU.
Note: Refer to 3GPP TS 23.040 [Error! Reference source not found.~~Fehler! Verweisquelle konnte nicht gefunden werden.~~] for a description and encoding of the various TP-DUs and RP-DUs.			

....

7.6.2.1 Connect SMS

7.6.2.1.1 Description

This IF is used to request the gsmSSF or gprsSSF to perform the actions to route the Short Message to a specific destination (for MO SMS) or to deliver the Short Message to the MS (for MT SMS).

7.6.2.1.2 Information Elements

Information element name	MO	MT	Description
Calling Partys Number	O	O	This IE indicates the subscriber who sent the SMS; possibly changed by the gsmSCF. If the Short Message type is SMS-SUBMIT or SMS-COMMAND, then this IE, if present, it shall replace the RP-Originating-Address in the RP-MO-DATA RPDU (CHOICE set to MSISDN). If the Short Message type is SMS-DELIVER, then this IE, if present, shall replace the TP-Originating-Address in the SMS-DELIVER TPDU. If the Short Message type is SMS-STATUS-REPORT, then this IE, if present, shall be ignored.

Information element name	MO	MT	Description
Destination Subscriber Number	O	-	This IE identifies the Destination short message entity; possibly changed by the gsmSCF. This IE, if present, shall replace the TP-Destination-Address in the SMS-SUBMIT TPDU or SMS-COMMAND-TPDU.
SMSC Address	O	-	This IE indicates the SMSC address to which the MO short message shall be submitted; possibly changed by the gsmSCF. This IE, if present, shall replace the RP-Destination-Address in the RP-MO-DATA RPDU (CHOICE set to serviceCentreAddressDA).

— For Information Only: 29.078 ASN.1 for ConnectSMS, InitialDPSMS —

```
ConnectSMSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    callingPartysNumber                 [0] SMS-AddressString                   OPTIONAL,
    destinationSubscriberNumber         [1] CalledPartyBCDNumber {bound}        OPTIONAL,
    sMSCAddress                         [2] ISDN-AddressString                  OPTIONAL,
    extensions                          [10] Extensions {bound}                 OPTIONAL,
    ...
    }


InitialDPSMSArg {PARAMETERS-BOUND : bound} ::= SEQUENCE {
    serviceKey                          [0] ServiceKey,
    destinationSubscriberNumber         [1] CalledPartyBCDNumber {bound}        OPTIONAL,
    callingPartyNumber                  [2] SMS-AddressString                   OPTIONAL,
    eventTypeSMS                        [3] EventTypeSMS                        OPTIONAL,
    iMSI                                [4] IMSI                                OPTIONAL,
    locationInformationMSC              [5] LocationInformation                 OPTIONAL,
    locationInformationGPRS             [6] LocationInformationGPRS             OPTIONAL,
    sMSCAddress                         [7] ISDN-AddressString                  OPTIONAL,
    timeAndTimezone                     [8] TimeAndTimezone {bound}             OPTIONAL,
    tPShortMessageSpecificInfo          [9] TPShortMessageSpecificInfo          OPTIONAL,
    tPProtocolIdentifier                [10] TPProtocolIdentifier               OPTIONAL,
    tPDataCodingScheme                  [11] TPDataCodingScheme                 OPTIONAL,
    tPValidityPeriod                    [12] TPValidityPeriod                   OPTIONAL,
    extensions                          [13] Extensions {bound}                 OPTIONAL,
    ...,
    smsReferenceNumber                  [14] CallReferenceNumber                OPTIONAL,
    mscAddress                          [15] ISDN-AddressString                 OPTIONAL,
    sgsn-Number                         [16] ISDN-AddressString                 OPTIONAL,
    ms-Classmark2                       [17] MS-Classmark2                      OPTIONAL,
    gPRSMSClass                         [18] GPRSMSClass                        OPTIONAL,
    iMEI                                [19] IMEI                               OPTIONAL,
    calledPartyNumber                   [20] ISDN-AddressString                 OPTIONAL
   }

CalledPartyBCDNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCalledPartyBCDNumberLength .. bound.&maxCalledPartyBCDNumberLength))
-- Indicates the Called Party Number, including service selection information.
-- Refer to 3GPP TS 24.008 [9] for encoding.

SMS-AddressString ::= AddressString (SIZE (1 .. maxSMS-AddressStringLength))
-- This data type is used to transport CallingPartyNumber for MT-SMS.
-- If this data type is used for MO-SMS, then the maximum number of digits shall be 16.

maxSMS-AddressStringLength INTEGER ::= 11
```

— For Information Only: 24.008, definition of Called Party BCD Number —

10.5.4.7 Called party BCD number

The purpose of the called party BCD number information element is to identify the called party.

The called party BCD number information element is coded as shown in figure 10.5.91/3GPP TS 24.008 and table 10.5.118/3GPP TS 24.008.

The called party BCD number is a type 4 information element with a minimum length of 3 octets and a maximum length of 43 octets. For PCS 1900 the maximum length is 19 octets.

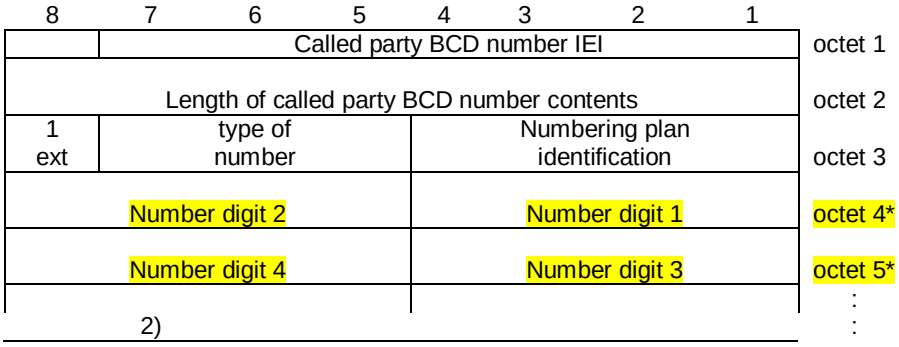


Figure 10.5.91/3GPP TS 24.008 Called party BCD number information element

NOTE 1: The number digit(s) in octet 4 precedes the digit(s) in octet 5 etc. The number digit which would be entered first is located in octet 4, bits 1 to 4.

NOTE 2: If the called party BCD number contains an odd number of digits, bits 5 to 8 of the last octet shall be filled with an end mark coded as "1111".

Since the information element must contain the complete called party BCD number there is no need for an additional complete indication.

Table 10.5.118/3GPP TS 24.008: Called party BCD number

Type of number (octet 3) (Note 1)	
Bits	
7 6 5	
0 0 0	unknown (Note 2)
0 0 1	international number (Note 3, Note 5)
0 1 0	national number (Note 3)
0 1 1	network specific number (Note 4)
1 0 0	dedicated access, short code
1 0 1	reserved
1 1 0	reserved
1 1 1	reserved for extension

NOTE 1: For the definition of "number" see ITU-T Recommendation I.330 and 3GPP TS 23.003 [10].

NOTE 2: The type of number "unknown" is used when the user or the network has no knowledge of the type of number, e.g. international number, national number, etc. In this case the number digits field is organized according to the network dialling plan, e.g. prefix or escape digits might be present.

NOTE 3: Prefix or escape digits shall not be included.

NOTE 4: The type of number "network specific number" is used to indicate administration/service number specific to the serving network, e.g. used to access an operator.

NOTE 5: The international format shall be accepted by the MSC when the call is destined to a destination in the same country as the MSC.

Table 10.5.118/3GPP TS 24.008: Called party BCD number (continued)

Numbering plan identification (octet 3)

Number plan (applies for type of number = 000, 001, 010 and 100)

Bits 4	3	2	1	
0	0	0	0	unknown
0	0	0	1	ISDN/telephony numbering plan (Rec. E.164/E.163)
0	0	1	1	data numbering plan (Recommendation X.121)
0	1	0	0	telex numbering plan (Recommendation F.69)
1	0	0	0	national numbering plan
1	0	0	1	private numbering plan
1	0	1	1	reserved for CTS (see 3GPP TS 44.056 [91])
1	1	1	1	reserved for extension

All other values are reserved.

- When an MS is the recipient of number information from the network, any incompatibility between the number digits and the number plan identification shall be ignored and a STATUS message shall not be sent to the network.

- In the case of numbering plan "unknown", the number digits field is organized according to the network dialling plan; e.g. prefix or escape digits might be present.

Table 10.5.118/3GPP TS 24.008: Called party BCD number (continued)

Number digits (octets 4, etc.)

Bits 4	3	2	1	or 8	7	6	5	Number digit value
0	0	0	0					0
0	0	0	1					1
0	0	1	0					2
0	0	1	1					3
0	1	0	0					4
0	1	0	1					5
0	1	1	0					6
0	1	1	1					7
1	0	0	0					8
1	0	0	1					9
1	0	1	0					*
1	0	1	1					#
1	1	0	0					a
1	1	0	1					b
1	1	1	0					c
1	1	1	1					used as an endmark in the case of an odd number of number digits

— For Information Only: 23.040, definition of address fields for SMS —

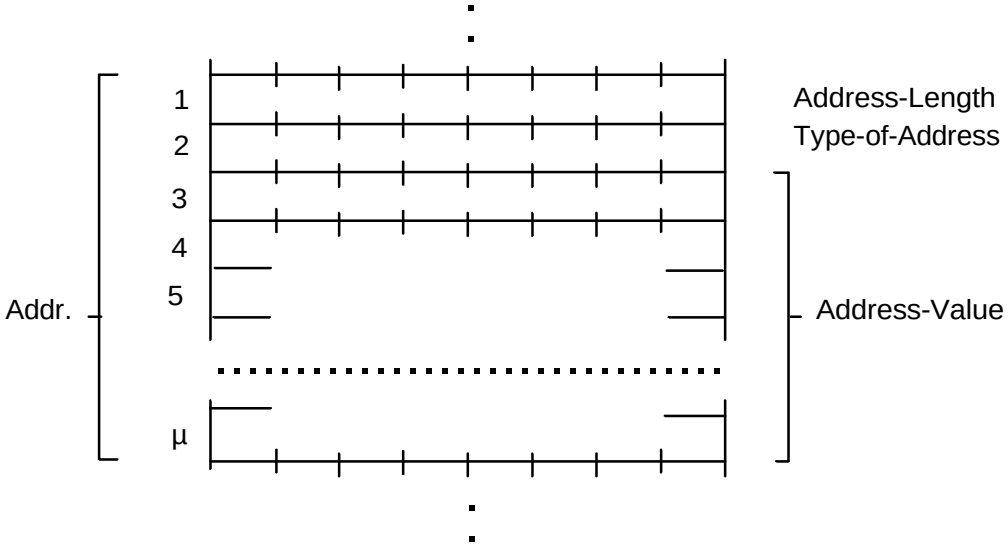
9.1.2.4 Alphanumeric representation

A field which uses alphanumeric representation shall consist of a number of 7-bit characters represented as the default alphabet defined in 3GPP TS 23.038 [9].

9.1.2.5 Address fields

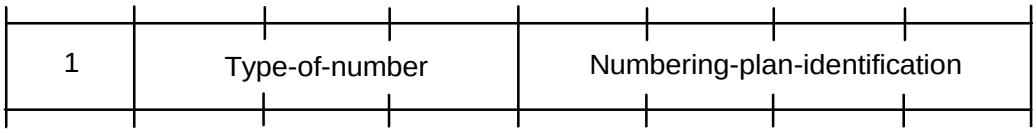
Address fields used by SM-RL are specified in 3GPP TS 24.011 [13] and 3GPP TS 29.002 [15].

Each address field of the SM-TL consists of the following sub-fields: An Address-Length field of one octet, a Type-of-Address field of one octet, and one Address-Value field of variable length; as shown below:



The Address-Length field is an integer representation of the number of useful semi-octets within the Address-Value field, i.e. excludes any semi octet containing only fill bits.

The Type-of-Address field format is as follows:



Type-of-number:

Bits 6 5 4

0 0 0	Unknown 1)
0 0 1	International number 2)
0 1 0	National number 3)
0 1 1	Network specific number 4)
1 0 0	Subscriber number 5)
1 0 1	Alphanumeric, (coded according to 3GPP TS 23.038 [9] GSM 7-bit default alphabet)
1 1 0	Abbreviated number
1 1 1	Reserved for extension

The MS shall interpret reserved values as "Unknown" but shall store them exactly as received.

The SC may reject messages with a type of number containing a reserved value or one which is not supported.

Reserved values shall not be transmitted by an SC conforming to this version of the specification.

1) "Unknown" is used when the user or network has no a priori information about the numbering plan. In this case, the Address-Value field is organized according to the network dialling plan, e.g. prefix or escape digits might be present.

2) The international format shall be accepted also when the message is destined to a recipient in the same country as the MSC or as the SGSN.

3) Prefix or escape digits shall not be included.

4) "Network specific number" is used to indicate administration/service number specific to the serving network, e.g. used to access an operator.

5) "Subscriber number" is used when a specific short number representation is stored in one or more SCs as part of a higher layer application. (Note that "Subscriber number" shall only be used in connection with the proper PID referring to this application).

Numbering-plan-identification

Bits 3 2 1 0

0 0 0 0 Unknown
0 0 0 1 ISDN/telephone numbering plan (E.164 [17]/E.163[18])
0 0 1 1 Data numbering plan (X.121)
0 1 0 0 Telex numbering plan
0 1 0 1 Service Centre Specific plan 1)
0 1 1 0 Service Centre Specific plan 1)
1 0 0 0 National numbering plan
1 0 0 1 Private numbering plan
1 0 1 0 ERMES numbering plan (ETSI DE/PS 3 01-3)
1 1 1 1 Reserved for extension
All other values are reserved.

1) "Service Centre specific number" is used to indicate a numbering plan specific to External Short Message Entities attached to the SMSC.

For Type-of-number = 101 bits 3,2,1,0 are reserved and shall be transmitted as 0000. Note that for addressing any of the entities SC, MSC, SGSN or MS, Numbering-plan-identification = 0001 shall always be used. However, for addressing the SME, any specified Numbering-plan-identification value may be used.

The MS shall interpret reserved values as "Unknown" but shall store them exactly as received.

The SC may reject messages with a type of number containing a reserved value or one which is not supported.

Reserved values shall not be transmitted by an SC conforming to this version of the specification.

Within the Address-Value field, either a semi-octet or an alphanumeric[1)] representation applies.

The maximum length of the full address field (Address-Length, Type-of-Address and Address-Value) is 12 octets.

1) Applies only to addressing at the SM-TL.

— For Information Only: 23.038, 7-bit characters (excerpt) —

6.1.2 Character packing

6.1.2.1 SMS Packing

6.1.2.1.1 Packing of 7-bit characters

If a character number α is noted in the following way:

b7 b6 b5 b4 b3 b2 b1
αa αb αc αd αe αf αg

The packing of the 7-bitscharacters in octets is done by completing the octets with zeros on the left.

For examples, packing: α

- one character in one octet:
  - bits number:

7 6 5 4 3 2 1 0
0 1a 1b 1c 1d 1e 1f 1g

- two characters in two octets:
  - bits number:

```
7  6  5  4  3  2  1  0
2g 1a 1b 1c 1d 1e 1f 1g
0  0  2a 2b 2c 2d 2e 2f
```

- three characters in three octets:
  - bits number:

```
7  6  5  4  3  2  1  0
2g 1a 1b 1c 1d 1e 1f 1g
3f 3g 2a 2b 2c 2d 2e 2f
0  0  0  3a 3b 3c 3d 3e
```

...

6.2.1 GSM 7 bit Default Alphabet

Bits per character: 7

CBS/USSD pad character: CR

Character table:

				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0	@	Δ	SP	0	¡	P	¿	p
0	0	0	1	1	£	_	!	1	A	Q	a	q
0	0	1	0	2	$	Φ	"	2	B	R	b	r
0	0	1	1	3	¥	Γ	#	3	C	S	c	s
0	1	0	0	4	è	Λ	¤	4	D	T	d	t
0	1	0	1	5	é	Ω	%	5	E	U	e	u
0	1	1	0	6	ù	Π	&	6	F	V	f	v
0	1	1	1	7	ì	Ψ	'	7	G	W	g	w
1	0	0	0	8	ò	Σ	(	8	H	X	h	x
1	0	0	1	9	Ç	Θ	)	9	I	Y	i	y
1	0	1	0	10	LF	Ξ	*	:	J	Z	j	z

1	0	1	1	11	Ø	1)	+	;	K	Ä	k	ä
1	1	0	0	12	ø	Æ	,	<	L	Ö	l	ö
1	1	0	1	13	CR	æ	-	=	M	Ñ	m	ñ
1	1	1	0	14	Å	ß	.	>	N	Ü	n	ü
1	1	1	1	15	å	É	/	?	O	§	o	à
NOTE 1): This code is an escape to an extension of the GSM 7 bit default alphabet table. A receiving entity which does not understand the meaning of this escape mechanism shall display it as a space character.												

— First modified section —

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] EN 302 646-1 v7 (3GPP TS 09.12 Phase 2+): "Application of ISDN User Part (ISUP) version 2 for the ISDN-Public Land Mobile Network (PLMN) signalling interface; Part 1: Protocol specification".

[2] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[3] 3GPP TS 22.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL); Service description, Stage 1".

[4] 3GPP TS 22.115: "Service Aspects Charging and Billing".

[5] 3GPP TS 23.003: "Numbering, addressing and identification".

[6] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS); Point-to-Point (PP)".

[7] 3GPP TS 23.078: " Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2".

[8] 3GPP TS 23.079: "Support of Optimal Routeing (SOR); Technical realization".

[9] 3GPP TS 24.008: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification (3GPP TS 24.008)".

[10] 3GPP TS 24.011: "Point-toPoint (PP) Short Message Service (SMS); support on mobile radio interface".

[11] 3GPP TS 29.002: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification (3GPP TS 29.002)".

[12] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface".

[13] 3GPP TS 32.205: "Telecommunication Management; Charging and billing; 3G call and event data for the Circuit Switched (CS) domain".

[14] 3GPP TS 32.215: "Telecommunication Management; Charging and billing; 3G call and event data for the Packet Switched (PS) domain".

[15] 3GPP TS 23.038: "Alphabets and language-specific information".

[16~~5~~] – [20] (Void)

[21] ETSI ES 201 296: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP); Signalling aspects of charging".

[22] ETSI ETS 300 287-1: "Integrated Services Digital Network (ISDN); Signalling System No.7; Transaction Capabilities (TC) version 2; Part 1: Protocol specification [ITU-T Recommendations Q.771 to Q.775 (1993), modified]".

[23] ETSI EN 300 356-1: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 3 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1997), modified]".

[24] ETSI ETS 300 374-1: "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 1: Protocol specification".

[25] ETSI EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[26] ETSI EN 301 140-5: "Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 1: Protocol Specification".

[27] – [40] (Void)

[41] ITU-T Recommendation Q.71: "ISDN circuit mode switched bearer services".

[42] ITU-T Recommendation Q.713: "Specifications of Signalling System No.7; SCCP formats and codes".

[43] ITU-T Recommendation Q.714: "Specifications of Signalling System No.7; Signalling Connection Control Part procedures".

[44] ITU-T Recommendation Q.762: "General function of messages and signals of the ISDN user part of signalling system no.7".

[45] ITU-T Recommendation Q.763: "Formats and codes of the ISDN user part of Signalling System No.7".

[46] ITU-T Recommendation Q.773: "Specifications of Signalling System No.7; Transaction capabilities formats and encoding".

[47] ITU-T Recommendation Q.850: "Usage of cause and location in the digital subscriber signalling system no.1 and the signalling system no.7 ISDN user part".

[48] ITU-T Recommendation Q.932: "Digital subscriber Signalling System No.1 (DSS 1) - Generic procedures for the control of ISDN supplementary services".

[49] ITU-T Recommendation Q.1218: "Interface Recommendation for Intelligent Network CS-1".

[50] ITU-T Recommendation Q.1224: "Distributed functional plane for intelligent network CS2".

[51] ITU-T Recommendation Q.1228: "Interface ITU-T Recommendation for intelligent network CS2".

[52] ITU-T Recommendation Q.1400: "Architecture framework for the development of signalling and organization, administration and maintenance protocols using OSI principles".

[53] ITU-T Recommendation X.680: "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[54] ITU-T Recommendation X.681: "Information technology – Abstract Syntax Notation One (ASN.1): Information object specification".

[55] ITU-T Recommendation X.682: "Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications".

[56] ITU-T Recommendation X.683: "Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification".

[57] ITU-T Recommendation X.690: "ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".

[58] ITU-T Recommendation X.880: "Data networks and open system communication - Open System Interconnection - Service definitions - Remote operations: Concepts, model and notation".

[59] ITU-T Recommendation X.881: "Data networks and open system communication - Open System Interconnection - Service definitions - Remote operations: OSI Realizations – Remote Operations Service Element (ROSE) service definition".

[60] ITU-T Recommendation X.882: "Data networks and open system communication - Open System Interconnection - Service definitions - Remote operations: OSI Realizations – Remote Operations Service Element (ROSE) protocol specification".

[61] – [80] (Void)

[81] ISO 9545 (1989): "Information technology - Open Systems Interconnection - Application Layer structure".

[82] – [90] (Void)

[91] ANSI T1.112-1996: "American National Standards for Telecommunications- Signalling System Number 7 (SS7) - Signalling Connection Control Part (SCCP)".

[92] ANSI T1.113-1995: "American National Standards for Telecommunications- Signalling System Number 7 (SS7) - ISDN User Part".

— Next modified section —

5 Common CAP Types

5.1 Data types

```
CAP-datatypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-network(1)
modules(3) cap-datatypes(52) version4(3)}

DEFINITIONS IMPLICIT TAGS ::= BEGIN

IMPORTS

    Duration,
    Integer4,
    Interval,
    LegID,
    ServiceKey
FROM CS1-DataTypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
modules(0) cs1-datatypes(2) version1(0)}

    BothwayThroughConnectionInd,
    CriticalityType,
    MiscCallInfo
FROM CS2-datatypes {itu-t(0) identified-organization(4) etsi(0) inDomain(1) in-network(1)
```

```
cs2(20) modules(0) in-cs2-datatypes(0) version1(0)}

    AddressString,
    Ext-BasicServiceCode,
    IMSI,
    ISDN-AddressString,
    NAEA-CIC
FROM MAP-CommonDataTypes {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
gsm-Network(1) modules(3) map-CommonDataTypes(18) version8(8)}


...


CalledPartyBCDNumber {PARAMETERS-BOUND : bound} ::= OCTET STRING (SIZE(
    bound.&minCalledPartyBCDNumberLength .. bound.&maxCalledPartyBCDNumberLength))
-- Indicates the Called Party Number, including service selection information.
-- Refer to 3GPP TS 24.008 [9] for encoding.
-- This data type carries only the "type of number", "numbering plan
-- identification" and "number digit" fields defined in 3GPP TS 24.008 [9];
-- it does not carry the "called party BCD number IEI" or "length of called
-- party BCD number contents".
-- In the context of the DestinationSubscriberNumber field in ConnectSMSArg or
-- InitialDPSMSArg, a CalledPartyBCDNumber may also contain an alphanumeric
-- character string. In this case, type-of-number '101'B is used, in accordance
-- with 3GPP TS 23.040 [6]. The address is coded in accordance with the
-- GSM 7-bit default alphabet definition and the SMS packing rules
-- as specified in 3GPP TS 23.038 [15] in this case.


...


SMS-AddressString ::= AddressString (SIZE (1 .. maxSMS-AddressStringLength))
-- This data type is used to transport CallingPartyNumber for MT-SMS.
-- If this data type is used for MO-SMS, then the maximum number of digits shall be 16.
-- An SMS-AddressString may contain an alphanumeric character string. In this
-- case, a nature of address indicator '101'B is used, in accordance with
-- 3GPP TS 23.040 [6]. The address is coded in accordance with the GSM 7-bit
-- default alphabet definition and the SMS packing rules as specified in
-- 3GPP TS 23.038 [15] in this case.

maxSMS-AddressStringLength INTEGER ::= 11


...
```

— Next modified section —

12.1 ConnectSMS procedure

12.1.1 General description

The gsmSCF uses this operation to request the smsSSF to continue Short Message processing, such as routeing a Short Message to a specific destination or delivering a Short Message to the served subscriber, with modified information.

12.1.1.1 Parameters

- callingPartysNumber:
  This parameter allows the gsmSCF to set the Calling Party Number parameter used in the network. It is used for showing the sending party's id (i.e. the originating address) to the receiving party.

- destinationSubscriberNumber:
  This parameter contains the ~~receiving party number to who~~ destination address to which the Short Message shall be routed by the SMSC.

- smscAddress:
  This parameter contains the Short Message Service Centre address towards which the Short Message shall be routed.

12.1.2 Responding entity (smsSSF)

12.1.2.1 Normal procedure

smsSSF preconditions:

(1) Mobile originating Short Message submission or Mobile terminating Short Message delivery attempt has been initiated.

(2) Short Message processing has been suspended at the DP SMS_Collected_Info or at DP SMS_Delivery_Requested.

(3) The smsSSF FSM is in the state "Waiting_for_Instructions".

smsSSF postconditions:

(1) The smsSSF performs the Short Message processing actions to route the Short Message to the specified destination or to deliver the Short Message to the served subscriber.

(2) Tssf is stopped.

On receipt of this operation, the smsSSF performs the following actions:

- if the callingPartysNumber, destinationSubscriberNumber or smscAddress are supplied, then these values shall be used for subsequent processing;
- if no EDPs have been armed, then the smsSSF transits to the state "Idle". Otherwise, the smsSSF transits to the state "Monitoring".

The smsSSF shall not perform any implicit arming or disarming of DPs.

Statistic counter(s) are not affected.

12.1.2.2 Error handling

Generic error handling for the operation related errors is described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

— Next modified section —

12.5 InitialDPSMS procedure

12.5.1 General description

The smsSSF uses this operation after detection of a TDP-R in the smsSF FSM, to request the gsmSCF for instructions to complete the Short Message submission to the SMSC or the Short Message delivery to the served subscriber.

12.5.1.1 Parameters

- destinationSubscriberNumber:
  ~~-~~This parameter carries the ISDN number of the entity receiving the short message or the ~~MSISDN~~ destination address of the destination subscriber, in an MO-SMS procedure.
- callingPartyNumber:
  In an MO-SMS procedure, this parameter carries the MSISDN of the subscriber. In an MT-SMS procedure, this parameter carries the address of the submitter of the short message (i.e. the originating address).
- eventType:
  This parameter indicates the armed smsSSF FSM DP, resulting in the InitialDPSMS operation.

- iMSI:
  IMSI of the mobile subscriber for whom the CAMEL service is invoked.

- locationInformationInMSC:
  This parameter indicates the location of the MSC of the served subscriber. This parameter shall be included only if the InitialDP operation is sent from the MSC.

- locationInformationInSGSN:
  This parameter indicates the location of the SGSN of the served subscriber. This parameter shall be included only if the InitialDPSMS operation is sent from the SGSN.

- serviceKey:
  This parameter indicates to the gsmSCF the requested IN service. It is used to address the required application/SLP within the gsmSCF; it is not for gsmSCF addressing.

- timeAndTimeZone:
  This parameter contains the time that the smsSSF was triggered, and the time zone that the invoking smsSSF resides in.

- tPDataCodingScheme:
  This parameter indicates the data coding scheme of the TP-User-Data element within the TPDU. It may indicate a message class. The message class may indicate e.g. the originator of the Short Message.

- tPShortMessageSpecificInfo:
  This parameter contains the 1st octet of the TPDU. Refer to 3GPP TS 23.040 [6] for a description of the various TPDUs.

- tPProtocolIdentifier:
  This parameter indicates the protocol used above the SM-Transfer Layer.

- tPValidityPeriod:
  This parameter indicates the length of the validity period or the absolute time of the validity period termination.

- sMSCAddress:
  This parameter defines the address of the SMSC to which the Short Message is intended to be submitted.

- smsReferenceNumber:
  This parameter contains the SMS Reference Number assigned to the Short Message by the MSC or SGSN.

- mscAddress:
  This parameter contains the E.164 address of the MSC. It shall be present if the SMS processing takes place in the MSC; otherwise shall be absent.

- sgsn-Number:
  This parameter contains the Global Title of the SGSN. It shall be present if the SMS processing takes place in the SGSN; otherwise it shall be absent.

- ms-Classmark2:
  This parameter contains the MS Classmark 2 of the mobile subscriber for which the service is invoked.

- gPRSMSClass:
  This parameter contains the GPRS MS capabilities of the mobile subscriber for which the CAMEL service is invoked.

- iMEI:
  This parameter contains the IMEI (with software version) of the mobile subscriber for which the service is invoked.

- calledPartyNumber:
  This parameter indicates the served subscriber in an MT-SMS procedure.

12.5.2 Invoking entity (smsSSF)

12.5.2.1 Normal procedure

smsSSF preconditions:

(1) A Short Message submission attempt or a Short Message delivery attempt has been initiated.

(2) An event has been detected at a DP.

(3) For MT-SMS, the event fulfilled the criteria for the DP being executed.

smsSSF postconditions:

(1) A control relationship has been established and the smsSSF waits for instructions from the gsmSCF.

The address of the gsmSCF the InitialDPSMS operation shall be sent to, shall be fetched from the MO-SMS-CSI or the MT-SMS-CSI. The smsSSF shall provide all available parameters to the gsmSCF.

A control relationship is established with the gsmSCF. The smsSSF application timer Tssf is laded with the deafult value and is started. It is used to prevent excessive Short Message submission or delivery suspension time.

12.5.2.2 Error handling

If the gsmSCF is not accessible, then the smsSSF instructs the MSC or SGSN to proceed with the Short Message processing in accordance with the Default SMS Handling parameter of the MO-SMS-CSI or MT-SMS-CSI.

If Tssf expires, then the smsSSF aborts the interaction with the gsmSCF by means of an abort to TC and shall instruct the MSC or SGSN to proceed with the Short Message processing in accordance with the Default SMS Handling parameter of the MO-SMS-CSI CSI or MT-SMS-CSI.

In the case of an MO-SMS Service, if the sending mobile party abandons after the sending of InitialDPSMS and before the TC dialogue is established, then the smsSSF shall abort the interaction with the gsmSCF by means of an abort to TC.

Generic error handling for the operation related errors is described in clause 10 and the TC services which are used for reporting operation errors are described in clause 14.

— END —

3GPP TSG CN WG2 Meeting #30 **N2-030463**
Sophia Antipolis, France, 25th – 29th August 2003 (revision of N2-030339)

CHANGE REQUEST

⌘ **23.078** **CR** **604** ⌘ **rev** **1** ⌘ Current version: **5.4.0** ⌘

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction to SMS Error handling
Source:	⌘	Ericsson
Work item code:	⌘	CAMEL4
Date:	⌘	28 August 2003
Category:	⌘	F (essential correction)
Release:	⌘	Rel-5

Use one 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)*

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘

The following corrections are needed for MT-SMS handling:

Sections 7.5.2.1 and 7.5.4.1 refer to TS 23.040 for information on the various TPDU types. However, TS 23.078 has many references to RPDU types as well. Therefore, TS 23.078 should refer also to TS 24.011 for a description of the various RPDU types.

Section 7.5.4.1.1 specifies that the Int_Error signal from SMS_SSF to MSC or SGSN is the result of Tssf expiry. However, this signal may also be the result of an SMS_SSF internal error. The error may e.g. incorrect formatting of information received from the SMSC, such that it can not be reported to the gsmSCF. This shall be mentioned in section 7.5.4.1.1.

Section 7.5.4.1.3 specifies the MSC or SGSN behaviour in the case of (a) RP-ERROR RPDU received from the MS, (b) internal failure in the MSC or SGSN and (c) time-out from the MS. However, nothing is specified for "***CP-Error from MS***". A CP-Error is an explicit event which may be reported from MS to MSC or SGSN. Hence, it should be mentioned in section 7.5.4.1.3, as one of the stimuli of the CAMEL_T_SMS_FAILURE procedure.
The present CR proposes that the handling of the occurrence of an CP-Error shall be identical as the handling of internal failure or time-out from the MS, i.e. the MT SMS Cause in the event report to the gsmSCF shall be set to "Protocol error, unspecified".

Section 7.6.1.2 (Initial DP SMS) specifies that the IE "TP Data Coding Scheme" is mandatory for the MT-SMS case. However, when the MT-SMS is a STATUS-REPORT, then the TP Data Coding Scheme may be absent from the SMS-STATUS-REPORT TPDU. Refer to TS 23.040, section 9.2.2.3; TP-DCS is marked as "O".

		Hence, TP Data Coding Scheme shall be marked as “C” for the MT-SMS case.
Summary of change:	⌘	Correct the errors as indicated above.
Consequences if not approved:	⌘	Incorrect implementation of CAMEL control of MT-SMS. As an example, the handling of a STATUS-REPORT may fail when the TP Data Coding Scheme is not present in the TDPU.

Clauses affected:	⌘	7.5.2.1, 7.5.4.1, 7.6.1.2				
		Y	**N**			
Other specs affected:	⌘		**X**	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

*** *First Modification* ***

7.5.2 Handling of mobile originating SMS

7.5.2.1 Handling of mobile originating SMS in the originating MSC or SGSN

The functional behaviour of the originating MSC or SGSN is specified in 3GPP TS 29.002 [**Error! Reference source not found.**] and 3GPP TS 23.060 [**Error! Reference source not found.**]. The procedures specific to CAMEL are specified in this subclause:

- Procedure CAMEL_O_SMS_INIT;
- Procedure CAMEL_O_SMS_SUBMITTED;
- Procedure CAMEL_O_SMS_FAILURE.

A CAMEL Service may be invoked for the following Mobile Originated short message types:

- Short Message Submission (TPDU type = SMS-SUBMIT)
- Short Message Command (TPDU type = SMS-COMMAND)

Refer to 3GPP TS 23.040 [**Error! Reference source not found.**] for a description of the various TPDU types and to 3GPP TS 24.011 [29] for a description of the protocol elements of the Short Message Relay Layer (RPDUs).

7.5.2.1.1 Actions of the MSC or SGSN on receipt of Int_Error

The MSC or SGSN checks the default SMS Handling parameter in MO-SMS-CSI.

If the default SMS handling is 'releaseTransaction', a A_RP_ERROR is sent to the MS. The MSC or SGSN then releases all resources and the procedure CAMEL_O_SMS_INIT ends.

If the default SMS handling is 'continueTransaction', the MSC or SGSN continues processing without CAMEL support.

7.5.2.1.2 Actions of the MSC or SGSN on receipt of Int_Continue_SMS

The MSC or SGSN continues processing with modified SM parameters. The MSC or SGSN shall transparently modify the SMS parameters with the received information. Parameters which are not included in the Int_Continue_SMS signal are unchanged.

7.5.2.1.3 Actions of the MSC or SGSN on receipt of Int_Connect_SMS

The MSC or SGSN continues processing with modified SM parameters. The MSC or SGSN shall transparently modify the SMS parameters with the received information. Barring is checked with the modified parameters. Parameters which are not included in the Int_Connect_SMS signal are unchanged.

7.5.2.1.4 Actions of the MSC or SGSN on receipt of Int_Release_SMS

A_RP_ERROR is sent to the MS and the Short Message is deleted. The SMS cause received in the Int_Release_SMS signal is used. The MSC or SGSN then releases all resources and the procedure CAMEL_O_SMS_INIT ends.

7.5.2.1.5 Allocation of SMS Reference Number

During the CAMEL handling of a Mobile Originated Short Message, the MSC or SGSN shall allocate an SMS Reference Number. This SMS Reference Number shall be placed in the SMS-MO Call Detail Record, together with the MSC Address or SGSN Number. This SMS Reference Number shall also be sent to the gsmSCF in the Initial DP SMS Information Flow, together with the MSC Address or SGSN Number. The combination of SMS Reference Number and MSC Address or SGSN Number forms a globally unique pair. This pair may be used for correlation of CDRs produced in the MSC or SGSN with CDRs produced in the gsmSCF.

An SMS Reference Number shall be generated and placed in the SMS-MO Call Detail Record, for every Short Message, including the case when a Short Message forms part of a set of concatenated Short Messages.

7.5.2.2 Handling of A_MM_Release and A_LLC_Release

If the radio link with the subscriber is lost during the handling of a CAMEL procedure in the MSC or SGSN, then the MSC or SGSN sends signal A_MM_Release_ind or A_LLC_Release_ind to that procedure. This results in the termination of that CAMEL procedure. (Refer to 3GPP TS 29.002 [**Error! Reference source not found.**] for details.)

7.5.2.3 Handling of time-out from SMSC

If the MSC or SGSN does not receive a confirmation from the SMSC after submission of a Short Message, then the MSC or SGSN calls procedure CAMEL_O_SMS_FAILURE. (Refer to 3GPP TS 29.002 [**Error! Reference source not found.**] for details.)

****** Next Modification ******

7.5.4 Handling of mobile terminating SMS

7.5.4.1 Handling of mobile terminating SMS in the terminating MSC or SGSN

A CAMEL Service may be invoked for the following Mobile Terminated short message types:

- Short Message Delivery (TPDU type = SMS-DELIVER)
- Short Message Status Report (TPDU type = SMS-STATUS-REPORT)

Refer to 3GPP TS 23.040 [**Error! Reference source not found.**] for a description of the various TPDU types and to 3GPP TS 24.011 [29] for a description of the protocol elements of the Short Message Relay Layer (RPDUs).

The functional behaviour of the terminating MSC or SGSN is specified in 3GPP TS 29.002 [**Error! Reference source not found.**]. The procedures specific to CAMEL are specified in the following subclauses:

7.5.4.1.1 Procedure CAMEL_T_SMS_INIT;

This procedure is called when a Short Message delivery attempt is received from the SMS-GMSC. If MT-SMS-CSI is present for the subscriber, then the SMS_SSF shall be invoked. Otherwise, the Short Message delivery attempt proceeds without CAMEL.

When the SMS_SSF is invoked and the SMS_SSF has requested the gsmSCF for instructions, the MSC or SGSN may receive the following responses from the SMS_SSF:

- Int_Continue_SMS

  The gsmSCF has indicated that SM delivery may proceed. It may have supplied the SMS_SSF with a modified Calling Party Number. This Calling Party Number shall replace the TP-Originating-Address in the SMS-DELIVER TPDU.

- Int_Release_SMS

  The gsmSCF has force-released SM delivery. The RP Cause received from the gsmSCF shall be conveyed to the SMS-GMSC in the RP-Cause component, in the RP-ERROR RPDU.

- Int_Error

  A Tssf time-out or an internal SMS_SSF error has occurred; the SM has not been forwarded to the Mobile Station. If Default SMS Handling equals 'Continue', the SM delivery proceeds. Otherwise, SM delivery shall be aborted. In the latter case, the RP-Cause component, in the RP-ERROR RPDU shall be set to EquipmentProtocolError, in accordance with 3GPP TS 29.002 [**Error! Reference source not found.**].

7.5.4.1.2 Procedure CAMEL_T_SMS_DELIVERED

This procedure is called when the MSC or SGSN has detected that delivery of the SM to the Mobile Station has succeeded. No event specific information is sent to the gsmSCF.

When Short Message delivery attempt success has been reported to the gsmSCF, then the MSC or SGSN may receive the following responses from the SMS_SSF:

- Int_Continue_SMS

  The event was reported to the gsmSCF in interrupt mode. The gsmSCF has concluded CAMEL processing and has terminated the Service Logic.

- Int_Continue

  The event was not reported to the gsmSCF or was reported in notification mode.

- Int_Error

  A Tssf time-out has occurred.

In all the above cases, the SM processing in the MSC or SGSN continues.

7.5.4.1.3 Procedure CAMEL_T_SMS_FAILURE

This procedure is called when the MSC or SGSN has detected that delivery of the SM to the Mobile Station has failed. If the delivery failure is due to RP-ERROR RPDU received from the MS, then the MT SMS Cause in the event report to the gsmSCF shall be set to the RP-Cause component in the RP-ERROR-RPDU. Otherwise, if the delivery failure is due to internal failure in the MSC or SGSN, CP-ERROR from MS or time-out from the MS, then the MT SMS Cause in the event report to the gsmSCF shall be set to "Protocol error, unspecified", as defined in 3GPP TS 24.011 [**Error! Reference source not found.**].

When Short Message delivery attempt failure has been reported to the gsmSCF, then the MSC or SGSN may receive the following responses from the SMS_SSF:

- Int_Continue_SMS

  The event was reported to the gsmSCF in interrupt mode. The gsmSCF has concluded CAMEL processing and has terminated the Service Logic.

- Int_Continue

  The event was not reported to the gsmSCF or was reported in notification mode.

- Int_Error

  A Tssf time-out has occurred.

In all the above cases, the SM processing in the MSC or SGSN continues.

7.5.4.1.4 Allocation of SMS Reference Number

During the CAMEL handling of a Mobile Terminating Short Message, the MSC or SGSN shall allocate an SMS Reference Number. This SMS Reference Number shall be placed in the SMS-MT Call Detail Record, together with the MSC Address or SGSN Number. This SMS Reference Number shall also be sent to the gsmSCF in the Initial DP SMS Information Flow, together with the MSC Address or SGSN Number. The combination of SMS Reference Number and MSC Address or SGSN Number forms a globally unique pair. This pair may be used for correlation of CDRs produced in the MSC or SGSN with CDRs produced in the gsmSCF.

An SMS Reference Number shall be generated and placed in the SMS-MT Call Detail Record, for every Short Message, including the case when a Short Message forms part of a set of concatenated Short Messages.

*** *Next Modification* ***

7.6.1 gsmSSF or gprsSSF to gsmSCF information flows

7.6.1.1 Event Report SMS

…

7.6.1.2 Initial DP SMS

7.6.1.2.1 Description

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

7.6.1.2.2 Information Elements

Information element name	MO	MT	Description
Destination Subscriber Number	M	-	This IE contains a number to identify the Destination short message entity. The Destination Subscriber Number shall be retrieved from the TP-Destination-Address in the SMS-SUBMIT TPDU or the SMS-COMMAND TPDU.
Called Party Number	-	M	This IE contains a number to identify the subscriber for whom the Short Message is destined. The Called Party Number shall be the MSISDN of the served subscriber.
Calling Party Number	M	C	For MO SMS: This IE contains a number to identify the subscriber who requests the SM submission. The Calling Party Number shall be the MSISDN of the served subscriber. For MT SMS: This IE contains the address of the submitter of the short message. For SMS-DELIVER TPDU, the Calling Party Number shall be retrieved from the TP-Originating-Address in the SMS-DELIVER TPDU. For SMS-STATUS-REPORT TPDU, this element shall not be included in this IF.
Event Type	M	M	This IE indicates the armed event resulting in the Initial DP SMS IF.
IMSI	M	M	This IE identifies the mobile subscriber.
Location Information In MSC	C	C	This IE is described in a table below.
Location Information In SGSN	C	C	This IE is described in a table below.
Service Key	M	M	This IE indicates to the gsmSCF the requested CAMEL Service. It is used to address the required application/SLP within the gsmSCF.
Time And Timezone	M	M	This IE contains the time that the gsmSSF or gprsSSF was triggered, and the time zone the gsmSSF or gprsSSF resides in.
TP Short Message Specific Information	M	M	This IE contains the first octet of the applicable TPDU. For SMS-SUBMIT, the following elements may be included: - Message Type Indicator - Reject Duplicates - Validity Period Format - Status Report Request - User Data Header Indicator - Reply Path For SMS-COMMAND, the following elements may be included: - Message Type Indicator - User Data Header Indicator - Status Report Request For SMS-DELIVER, the following elements may be included: - Message Type Indicator - More Messages to Send - Status Report Indication - User Data Header Indicator - Reply Path For SMS-STATUS-REPORT, the following elements may be included: - Message Type Indicator - More Messages to Send

Information element name	MO	MT	Description
			- Status Report Qualifier - User Data Header Indicator Refer to 3GPP TS 23.040 [**Error! Reference source not found.**] for an indication of which elements of this 1st octet are Mandatory and which elements are Conditional.
TP Protocol Identifier	M	C	This IE indicates the protocol used above SM-Transfer Layer. The TP Protocol Identifier shall be retrieved from the applicable TPDU. For SMS-STATUS-REPORT, the sending of this IE is Conditional, depending on its presence in the SMS-STATUS-REPORT TPDU.
TP Data Coding Scheme	C	~~M~~C	This IE indicates the data coding scheme of the TP-User Data field, and may indicate a message class. The message class may indicate e.g. the originator of the Short Message. The TP Data Coding Scheme shall be retrieved from the applicable TPDU. For SMS-COMMAND, this IE shall not be included in this IF.
TP Validity Period	S	-	This IE indicates the length of the validity period or the absolute time of the validity period termination. This IE is used only for the SMS-SUBMIT TPDU. The TP Validity Period, if available, shall be retrieved from the SMS-SUBMIT TPDU. For other TPDU, this IE shall not be included in this IF.
SMSC Address	M	M	For MO SMS: This IE defines the address of the SMSC to which the MO short message is intended to be submitted. It shall be retrieved from the RP-Destination-Address in the RP-MO-DATA RPDU. For MT SMS: This IE identifies the address of the SMSC from which the MT short message is originating. It shall be retrieved from the RP-Originating-Address in the RP-MT-DATA RPDU.
SMS Reference Number	M	M	This IE carries the SMS Reference Number. This Reference Number is allocated by the MSC or SGSN that processes the Short Message. It may be used by the gsmSCF for inclusion in a gsmSCF SMS record.
MSC Address	S	S	This IE carries the E.164 MSC Address. This IE shall be present if the Short Message processing takes place in an MSC. Otherwise shall be absent.
SGSN Number	S	S	This IE carries the Global Title of the SGSN. See 3GPP TS 23.060 [**Error! Reference source not found.**]. This IE shall be present if the Short Message processing takes place in an SGSN. Otherwise shall be absent.
GPRS MS Class	C	-	This IE contains the MS network and radio access capabilities if the short message is being transferred through an SGSN.
MS Classmark 2	C	-	This IE contains the MS classmark 2 if the short message is being transferred through an MSC.
IMEI (with software version)	C	-	This IE contains the IMEISV (as defined in 3GPP TS 23.003 [**Error! Reference source not found.**]) of the ME in use by the served subscriber.
Note: Refer to 3GPP TS 23.040 [**Error! Reference source not found.**] for a description and encoding of the various TP-DUs and RP-DUs.			

Location Information in MSC is based on the Location Information IE defined in 3GPP TS 23.018 [**Error! Reference source not found.**]. The following differences apply:

Information element name	MO	MT	Description
Location number	C	C	See 3GPP TS 23.018 [**Error! Reference source not found.**].
VLR number	M	M	See 3GPP TS 23.018 [**Error! Reference source not found.**].
Age of location information	-	M	See 3GPP TS 23.018 [**Error! Reference source not found.**].
Current Location Retrieved	-	-	Not applicable
Selected LSA Identity	S	S	This IE is applicable only if SoLSA is supported by the MSC. This IE indicates the LSA identity associated with the current position of the MS. It shall be shall be present if the LSA ID in the subscriber data matches the LSA ID of the current cell. In the case of multiple matches the LSA ID with the highest priority shall be present. See 3GPP TS 23.073 [**Error! Reference source not found.**].

Location Information in SGSN is based on the Location Information For GPRS IE defined in the subclause **Error! Reference source not found.**. The following differences and clarifications apply:

Information element name	MO	MT	Description
Service area ID	C,E	C,E	
Cell ID	C,E	C,E	
Location area ID	C,E	C,E	
Routeing area ID	C	C	
Geographical information	C	C	
Geodetic information	-	-	Not applicable
Age of location information	-	-	Not applicable
Current Location Retrieved	-	-	Not applicable

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