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ETSI Standard

**Short Message Service (SMS) for fixed networks;
Network Based Solution (NBS);
Part 3: Integrated Services Digital Network (ISDN)
access protocol;**

Reference

DES/SPAN-130286

Keywords

ISDN, DSS1, SMS, functional, protocol

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 3 of a multi-part standard covering the Short Message Services (SMS) for fixed networks; Networks Based Solution (NBS), as described below:

Part 1: "Overview";

Part 2: "Architecture and functional entities";

Part 3: "Integrated Services Digital Network (ISDN) access protocol";

Part 4: "Interworking between Signalling System No.7 (SS7) and Digital Suscriber Signalling System No. one (DSS1)";

Part 5: "Network access protocol".

NOTE: The choice of a multi-part format for this deliverable is to facilitate maintenance and future enhancements.

In accordance with ITU-T Recommendation I.130 [4], the following three level structure is used to describe the supplementary telecommunication services as provided by European public telecommunications operators under the pan-European ISDN:

- Stage 1 is an overall service description, from the user's standpoint;

- Stage 2 identifies the functional capabilities and information flows needed to support the service described in stage 1; and

- Stage 3 defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

The present document details the stage 3 aspects (signalling system protocols and switching functions) needed to support the SM service. The stage 1 aspects are detailed in ES 201 986 [10]. The stage 2 aspects of the SM service have not been specified.

The present version updates the references to the basic call specifications.

Introduction

The Short Message Service (SMS) is a service, applicable at the coincident S and T reference point and T reference point, to provide the served user the ability to send and receive Short Messages. The Short Messages (SM) are exchanged between the sending and receiving user via a Short Message Service Centre (SM-SC).

1   Scope

The present document specifies the stage three of the Short Message Service (SMS) for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [6]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see ITU-T Recommendation I.130 [4]).

In addition, the present document specifies the protocol requirements at the T reference point where the service is provided to the user via an intermediate private ISDN.

The present document does not specify the additional protocol requirements where the service is provided to the user via a telecommunication network that is not an ISDN but it does include interworking requirements of other networks with the public ISDN.

The SM service is provided independently of a call.

Charging principles are outside the scope of the present document.

The SM service enables the originating SMS user to send Short Messages (SMs) to the receiving SMS user via a Short Message Service Centre (SM-SC), belonging to the network of the SMS originating user (served user) or separated from the network of the SM originating user.

> NOTE: The SM service is typically used between a Short Message service provider and a user (receiving user) of the Short Message service provided.

Further parts of the present document specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment supporting the SM service, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

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 and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1]   ETSI EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2]   ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[3]   ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".

[4]   ITU-T Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[5]   ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

[6]   ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

[7]   ITU-T Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

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

[9]   ITU-T Recommendation X.880: "Information technology - Remote Operations: Concepts, model and notation".

[10]   ETSI ES 201 986 V1.1.1 (2001-11): "Services and Protocols for Advanced Networks (SPAN); Short Message Service (SMS) for PSTN/ISDN; Service description".

[11]   ETSI TS 123 040 V5.3.0: "Digital cellular telecommunications system (GSM);Universal Mobile Telecommunications System (UMTS);Technical realization of the Short Message Service (SMS) (3GPP TS 23.040 version 5.3.0 Release 5)".

[12]   ETSI ES 201 912: "Access and Terminals (AT); Short Message Service (SMS) for PSTN/ISDN; Short Message Communication between a fixed network Short Message Terminal Equipment and a Short Message Service Centre".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

basic access: See ITU-T Recommendation Q.9 [7].

basic call procedures: procedures by which a call (as an instance of a telecommunications service) is established and terminated

delivery report: response from the destination terminal to the SM-SC indicating that an SM has been accepted or not with the appropriate cause, if rejected

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [3].

ISDN number: number conforming to the numbering plan and structure specified in ITU-T Recommendation E.164 [2].

invoke component: where reference is made to a "xxxx" invoke component, an invoke component is meant with its operation value set to the value of the operation "xxxx"

    NOTE: See EN 300 196-1 [1], clause 8.2.2.1.

network: DSS1 protocol entity at the network side of the user-network interface

originating SMS user: user that originates and sends the SM, also called the served user

primary rate access: See ITU-T Recommendation Q.9 [7].

private network: DSS1 protocol entity at the user side of the user-network interface at the T reference point

public network: DSS1 protocol entity at the network side of the user-network interface at the T reference point

receiving SMS user (destination SMS user): the user that receives the Short Message and who may also deactivate the reception of SMs and reactivate the reception later on

receiving user number: ISDN number of the user, that receives the Short Message

reject component: See EN 300 196-1 [1], clause 8.2.2.4.

reply path procedure: mechanism which allows an SM-TE to request that an SM-SC should be permitted to handle a reply sent in response to a message previously sent from that SM-TE to another SM-TE

> NOTE: This may happen even though the SM-SC may be unknown to the SM-TE which received the initial message.

return error component: where reference is made to a "xxxx" return error component, a return error component is meant which is related to a "xxxx" invoke component

> NOTE: See EN 300 196-1 [1], clause 8.2.2.3.

return result component: where reference is made to a "xxxx" return result component, a return result component is meant which is related to a "xxxx" invoke component

> NOTE: See EN 300 196-1 [1], clause 8.2.2.2.

served user: user to whom the SMS is provided, also called the originating user

served user number: ISDN number of the user who subscribes to, activates, deactivates or interrogates the Short Message services

service/telecommunication service: See ITU-T Recommendation I.112 [3].

Short Message (SM): information, that may be conveyed by means of the SMS described in the present document

Short Message Service Centre (SM-SC): function unit, which is responsible for the relaying and store-and-forwarding of a short message (SM) between two SM-TE

> NOTE: The SM-SC can functionally be separated from or integrated in the network.

Short Message Service Centre Number (SM-SCNr): ISDN number of the Short Message Service Centre

Short Message Terminal (SM-TE): terminal which may send or receive short messages

Status Report: information used to inform the originating SM-TE of the status of a short message previously submitted by this SM-TE

> EXAMPLE: whether the SM-SC was able to successfully forward the message or not, or whether the message was stored in the SM-SC for later delivery.

submit report: response from the SM-SC to the originating terminal indicating that an SM has been accepted or not with the appropriate cause, if rejected

supplementary service: See ITU-T Recommendation I.210 [5], clause 2.4.

user: DSS1 protocol entity at the user side of the user-network interface

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ASE	Application Service Element
ASN.1	Abstract Syntax Notation One
DSS1	Digital Subscriber Signalling System No. one
DLL	Data Link Layer
ISDN	Integrated Services Digital Network
PDU	Protocol Data Unit
PL	Physical Layer
PIN	Personal Identification Number
RL	Relay Layer
SDL	Specification and Description Language
SM	Short Message
SMs	Short Messages
SMS	Short Message Service
SM-SC	Short Message Service Centre

SM-TE	Short Message Terminal
TL	Transport Layer

4   Description

The Short Message Service (SM) service shall be available to users who are connected to the network via a basic access or primary rate access.

The Short Message Service (SMS) enables an originating user to send a SM of a limited size to a destination user.

A Short Message (SM) can be initiated upon a request of the sending user or by the service provider itself, and shall be sent to the receiving user. An SM is always conveyed via an SM-SC. The SM-SC receives the SM from an originating SM-TE (sending user), converts the message if necessary, and relays the SM to the terminating SM-TE (receiving user).
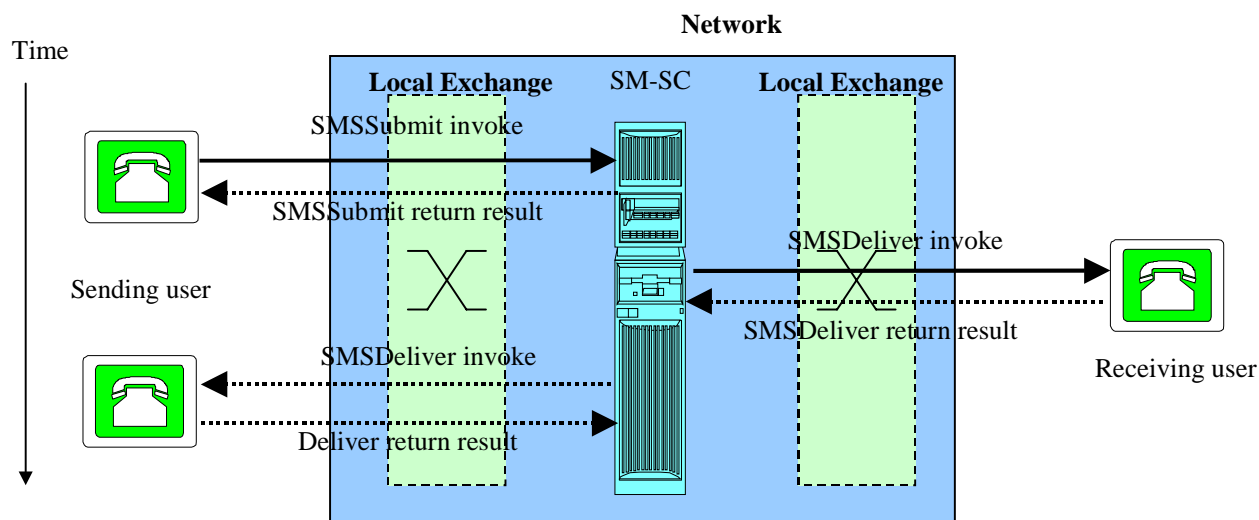
Figure 1: SMS submission, delivery and confirmation

A submit report is sent from an SM-SC to an SM-TE within a sMSSubmit return result component and may be either a positive report, which confirms the correct submission of an SM to the SM-SC, or a negative report, which informs the SM-TE that the SM was not successfully submitted with the error reason.

A deliver report is sent to an SM-SC within a sMSDeliver return result and may be either a positive report, which confirms the correct delivery of an SM to the receiving SM-TE, or a negative report, which informs the SM-SC that the SM was not successfully delivered with the error reason.

If the option to provide a status report is invoked and supported, a status report is sent from the SM-SC to the originating SM-TE in a sMSDeliver invoke component; the SM-TE acknowledges correct receipt of the status report.

Having received one or more SMs, the receiving user can subsequently read, store or delete the messages on its terminal. If the SM-TE supports the optional Replace Short Message Function, Short Messages (SMs) with the respective Replace Short Message Type indication held in the SM-TE are automatically replaced by received new ones.

The means by which the receiving user manages these features are outside the scope of the present document.

The preparation of an SM as well as the kind of data transmission between the sending or receiving users and the SM-SC are outside the scope of the present document.

5   Operational requirements

5.1   Provision and withdrawal

The SMS shall be provided to the service provider (SM-SC) after prior arrangement with the network operator.
The SMS shall be withdrawn on the service provider's (SM-SC) request or for network operator reasons.

The SMS shall be provided to the SMS user after prior arrangement with the network operator and/or the service provider or be generally available.
The SMS shall be withdrawn on the SMS user's request or for network operator or service provider (SM-SC) reasons.

Provision of the SMS shall be on a number basis.

The SM service shall apply to the basic access and to the primary rate access.

As a network operator option, the SMS user can have a subscription option to register the SM-SC number to which outgoing messages shall be sent to.

The maximum number of SM-SC numbers from which incoming messages shall be accepted is a network operator option.

Table 1 contains the network and service provider options for SMS.

Table 1: Network options/service provider options

Network options	Values	Network option	Service Provider option
Support of subscription option for registration of the SM-SC number to which outgoing messages shall be sent	yes no	X	
Maximum number of SM-SC numbers from which incoming messages shall be accepted	any integer value	X	
Registration and erasure procedure for the SM-originating user	yes no		X
Registration and erasure procedure for the SM-receiving user	yes no		X
PIN required for registration and erasure procedure	yes no		X
Activation/deactivation of the receipt of SM	yes no		X
PIN required for activation/deactivation procedure	yes no		X
Interrogation of SM service, whether the service is activated or deactivated	yes no		X

5.2   Requirements on the receiving user's network side

Void.

5.3   Requirements on the controlling user's network side

Void.

6 Coding requirements

The SM-TL PDUs according to TS 123 040 [11] are transported transparently within a SMS-ASE in sMSSubmit and sMSDeliver invoke components and return result components (all the SMS commands are transported transparently in the Data component within the SMSSubmit and SMSDeliver components).
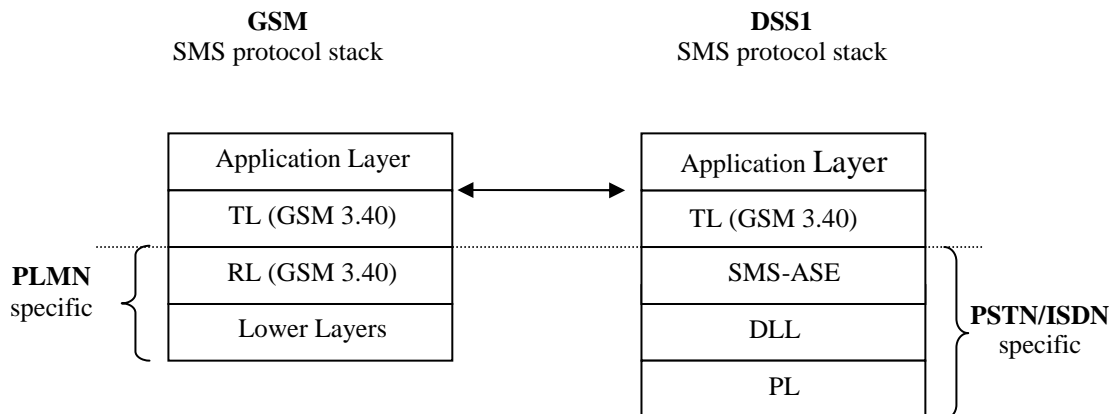
Figure 2: Relationship between SMS protocol stack in GSM and transport in DSS1

Table 2 shows the definitions of the operations and errors required for the SM service using ASN.1 as specified in ITU-T Recommendation X.680 [8] and using the OPERATION and ERROR macros as defined in figure 4 of ITU-T Recommendation X.880 [9].

The formal definition of the component types to encode these operations and errors is provided in clause D.1 of EN 300 196-1 [1].

The inclusion of components in facility information elements is defined in EN 300 196-1 [1], clause 11.2.2.1.

All components (invoke, return result, return error and reject) shall be included within a facility information element. This facility information element may be included in any appropriate message as specified in EN 300 196-1 [1], clause 8.3.1.1, unless a more restrictive specification is given in clause 7 of the present document.

Table 2: Definition of operations and errors for the SMservice

```
SMS-Operations-and-Errors { itu-t identified-organization etsi(0) xxx operations-and-errors(1)}

DEFINITIONS EXPLICIT TAGS EXTENSIBILITY IMPLIED::=

BEGIN

EXPORTS

          SMSSubmit,
          SMSDeliver,

          InvalidSM_SCNr,
          SMSRejected,
          NotInvoked,
          IndicationNotDelivered

;
IMPORTS    Code, ERROR, OPERATION,

          FROM Remote-Operation-Notation
               {joint-iso-itu-t remote-operations(4) notation(0)}

          notSubscribed,
          resourceUnavailable,
          invalidServedUserNr
          FROM General-Errors
               { itu-t identified-organization etsi(0) 196 general-errors(2)}

          invalidReceivingUserNr
```

```
            FROM MWI-Operations-and-Errors
                { itu-t identified-organization etsi(0) 745 operations-and-erors(1)}

            PresentedNumberScreened,
            PartyNumber
            FROM Addressing-Data-Element
                {itu-t identified-organization etsi(0) 196 addressing-data-elements(6)}
;

sMSSubmit        OPERATION ::{
                ARGUMENT        SMS-Submit-Argument
                RESULT          SMS-Submit-Result
                ERRORS          {SMS-Submit-Failure}
                CODE            sMS-Submit-Code
}
-- End of SMSSubmit operation definition


SMS-Submit-Argument      ::=SEQUENCE {
                servedUserNr                    PresentedNumberScreened,
                receivingUserNr                 PartyNumber,
                sMSData                         SMSData,
                                                -- SMSData contains one of the following
                                                -- TL messages: SMS_SUBMIT, SMS_COMMAND
                sM_SCNr                 [1] PartyNumber            OPTIONAL,
                additions               [2] Additions             OPTIONAL}

SMS-Submit-Result        ::=SEQUENCE {
                servedUserNr                    PresentedNumberScreened,

                                                -- In the SMS-Submit-Result, either a
                                                -- positive (sMSAck) or negative
                                                -- confirmation (sMSNack) is present
                sMS-POS-NEG-CONF            CHOICE {
                    sMSAck                       SMSAck,
                                                -- SMSAck contains a positive
                                                -- SMS_SUBMIT_REPORT
                    sMSNack                      SMSNack,
                                                -- SMSNack contains a negative
                                                -- SMS SUBMIT REPORT
                }
                additions               [1] Additions         OPTIONAL,
                sM_SCNr                 [2] PartyNumber    OPTIONAL }

sMS-Submit-Failure              ERROR ::={
PARAMETER               TypeOf_SubmitError
CODE                    sMS-Submit-FailureCode
}

TypeOf_SubmitError          ::= ENUMERATED {
                        notSubscribed       (0),
                        resourceUnavailable   (1),
                        invalidServedUserNr  (2),
                        invalidReceivingUserNr (3),
                        invalidSM_SCNr       (4),
                        indicationNotDelivered (5),
                        sMSRejected          (6)
}



sMSDeliver        OPERATION ::={
                ARGUMENT        SMS-Deliver-Argument
                RESULT          SMS-Deliver-Result
                ERRORS          {sMS-Deliver-Failure}
                CODE            sMS-Deliver-Code
}
-- End of SMSDeliver operation definition


SMS-Deliver-Argument         ::=SEQUENCE {
                                servedUserNr    PresentedNumberScreened,
                                receivingUserNr   PartyNumber,
                                sM_SCNr     [1] PartyNumber    OPTIONAL,
                                additions   [2] Additions      OPTIONAL,
                                sMSData         SMSData
                                    --sMSData contains one of the following
                                    -- TL messages: SMS_DELIVER, SMS_STATUS_REPORT
```

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```
                                  }
SMS-Deliver-Result              ::=SEQUENCE {
                                       sM_SCNr               PartyNumber,

                                  sMS-POS-NEG-CONF      CHOICE {
                                       sMSAck                    SMSAck
                                                            -- SMSAck contains a positive
                                                            -- SMS-Deliver-Report
                                       sMSNack                   SMSNack
                                                            -- SMSNack contains a negative
                                                            -- SMS-Deliver-Report
                                  }
                                  additions             Additions      OPTIONAL }
                             }
sMS-Deliver-Failure          ERROR ::={
PARAMETER                    TypeOf_DeliverError
CODE                         sMS-Deliver-FailureCode
}

TypeOf_DeliverError              ::= ENUMERATED
{
                                  invalidServedUserNr    (0),
                                  invalidSM_SCNr         (1),
                                  resourceUnavailable    (2),
                                  invalidReceivingUserNr (3),
                                  sMSRejected            (4)
}




SMSData                     ::= OCTET STRING (SIZE(0..255)
SMSAck                      ::= OCTET STRING (SIZE(0..255)
SMSNack                     ::= OCTET STRING (SIZE(0..255)
-- SMSData, SMSAck and SMSNack contain transfer layer data of 3GPP TS 23.040


Additions                   ::=     CHOICE     {
                       freeData    [0] OCTET STRING (SIZE (0..255)),
                       networkData [1] SEQUENCE   (SIZE(0..255)) OF Subparam }
Subparam                    ::= SEQUENCE    {
                                  parametername   INTEGER (0..255),
                                  parameterlength INTEGER (0..255),
                                  parameterdata   OCTET STRING (SIZE(0..255)) }
)
-- for network specific use (Note: The Additional Information Field can be constructed either as a
'free' octet string or as a list of ISUP-parameters)


sMSOID OBJECT IDENTIFIER          ::= {itu-t identified-organization etsi(0) 202060
                             operations-and-errors(1)}


sMSSubmit_Code                 Code::= global:{sMSOID 1}
sMSDeliver_Code                Code::= global:{sMSOID 2}

invalidSM_SCNr              InvalidSM_SCNr              ::= global:{sMSOID 10}
sMSRejected                SMSRejected                 ::= global:{sMSOID 11}
indicationNotDelivered     IndicationNotDelivered      ::= global:{sMSOID 12}


END -- SMS-Operations-and-Errors
```

7 Signalling procedures at the coincident S and T reference point

7.1 Registration

Registration is a service provider option. Registration is performed between the SM-TE and the SM-SC. Registration information exchanged between the SM-TE and the SM-SC is transferred within sMSSubmit invoke component (registration request) in and the sMSDeliver invoke component (registration response) in the sMSData structure(see figure 2). The receivingUserNr parameter may not contain the number of the receiving user, in case the of a registration.

7.2 Activation of the SMS at the originating user's interface

The SM service shall be activated on provision and deactivated on withdrawal.

As a service provider option, the SMS user may activate and deactivate the SMservice. The activation and deactivation of the SMservice may protected by the use of the Personal Identification Number (PIN).

Activation information exchanged between the SM-TE and the SM-SC is transferred within sMSSubmit invoke component (activation request) and in the sMSDeliver invoke component (activation response) in the SMSData structure (see figure 2). The receivingUserNr parameter may not contain the number of the receiving user, in case the of an activation.

7.3 Deactivation of the SMS at the originating user's interface

As a service provider option, the SMS user may deactivate and again activate the SM service.

Deactivation information exchanged between the SM-TE and the SM-SC is transferred within sMSSubmit invoke component (deactivation request) and in the sMSDeliver invoke component (deactivation response) in the SMSData structure (see figure 2). The receivingUserNr parameter may not contain the number of the receiving user, in case the of a deactivation.

7.4 Deactivation of the reception of SMs

As a service provider option, the SMS user may deactivate the reception of SMs. The sending of SMs is not affected by the deactivation of SMs. To re-activate the reception of SMs, the SMS user shall activate the SM service according to clause 7.2.

Deactivation of reception information exchanged between the SM-TE and the SM-SC is transferred within sMSSubmit invoke component (deactivation reception request) and in the sMSDeliver invoke component (deactivation reception response) in the SMSData structure (see figure 2). The receivingUserNr parameter may not contain the number of the receiving user, in case the of a deactivation of reception.

7.5 Invocation of SMS at the originating user's interface

7.5.1 Normal operation

The SMservice shall be invoked by the originating SMS user by sending a SMSSubmit invoke component to the network in a facility information element according to the procedures of clause 8.3.2.4 of EN 300 196-1 [1].

The originating SMS user shall indicate in the SMSSubmit invoke component:

- in the "servedUserNr" parameter, the ISDN number of the SMS user from whom the SM is sent;

- in the "receivingUserNr" parameter, the ISDN number of the user to whom the SMS shall be sent;

- in the "sMSData" parameter, the SM data (i.e. a SMS_SUBMIT TL message or a SMS_COMMAND TL message containing e.g. text, binary information, commands, etc.) provided by the originating SMS user.

- optionally, in the "sM_SCNr" parameter, the ISDN number of the Short Message Service Centre, to which the SM shall be sent;

- optionally, in the "additions" parameter, information for network specific use.

On receipt of the SMSSubmit invoke component, the network shall send the SMS submit_request to the SM-SC.

On receipt of a SMS submit_report from the SM-SC, the network shall send a SMSSubmit return result component to the originating SMS user in a facility information element according to the procedures of clause 8.3.2.4 of EN 300 196-1 [1].

The network (i.e. the SM_SC) shall indicate in the SMSSubmit return result component:

- in the "servedUserNr" parameter, the ISDN number of the SMS user from whom the SM was sent;

- in the "sMSAck or sMSNack" parameter, the positive or negative SM result (i.e. a SMS_SUBMIT_REPORT TL message containing the response of the Service Centre to the respective SMS_SUBMIT or SMS_COMMAND TL message sent by the originating SMS user)". In case of a positive result, the sMSAck parameter shall be used, in case of a negative result the sMSNack parameter shall be used.

- optionally, in the "sM_SCNr" parameter, the ISDN number of the Short Message Service Centre (SM-SC), to which the SM was sent;

- optionally, in the "additions" parameter, information for network specific use.

When the SMS user receives a correctly encoded SMSSubmit return result component, then the SMS user shall accept the provided information and shall not respond to the network.

7.5.2   Exceptional procedure

If the network is unable to invoke the SM service, the network shall send a SMSSubmit return error component to the SMS user within a facility information element, using the procedures described in clause 8.3.2.2 of EN 300 196-1 [1], indicating one of the following error values:

- "notSubscribed", if (for a given ISDN number) the SM service has not been subscribed to by the user;

- "resourceUnavailable", if the resources required to perform adequately the SM service are not available. This error shall be used to indicate a congestion situation;

- "invalidServedUserNr", if the ISDN number provided to identify the SMS user (the user who sends the SM) is not a valid number;

- "invalidReceivingUserNr", if the ISDN number of the addressed user, to whom the SMS shall be sent, is invalid or not allowed;

- "invalidSM_SCNr", if the SMS user has provided an ISDN number of the SM-SC which is incorrect or the SMS user is not allowed to override the SM-SC number of the service provider;

- "indicationNotDelivered", if the network is not able to forward or deliver the SM;

- "sMSRejected", if the SMS has not been accepted.

On receipt of a SMSSubmit return error component, the SMS user shall consider that this attempt to invoke the SM service has failed.

If a reject component is received by either the SMS user or the network and the invoke identifier is included, the reject component shall be ignored.

7.6   Invocation of SMS at the receiving user's interface

7.6.1   Normal operation

When the receiving user's network successfully activates an instance of the SM service (the receiving user has not deactivated the reception of SMs) to send an SMS to the receiving user, the receiving user's network shall send a SMSDeliver invoke component to the receiving user in a facility information element according to the procedures of clause 8.3.2.4 of EN 300 196-1 [1].

The receiving user's network shall indicate in the SMSDeliver invoke component:

- in the "servedUserNr" parameter, the ISDN number of the SMS user from whom the SM was sent;

- in the "receivingUserNr" parameter, the ISDN number of the user to whom the SM has been addressed;

- optionally, in the "sM_SCNr" parameter, the ISDN number of the Short Message Service Centre (SM-SC), from which the SM is sent;

- in the "sMSData" parameter, the SM data (i.e. a SMS_DELIVER_TL message or a SMS_STATUS_REPORT TL message containing e.g. text, binary information, etc);

    NOTE: The SMSDeliver invoke component may contain in the sMSData parameter indications from the SM_SC to the served user.

- optionally, in the "additions" parameter, information for network specific use.

On receipt of a correctly encoded SMSDeliver invoke component from the network, the receiving user shall send a SMSDeliver return result component to the network in a Facility information element according to the procedures of clause 8.3.2.2 of EN 300 196-1 [1].

The receiving user shall indicate in the SMSDeliver return result component:

- in the "sM_SCNr" parameter, the ISDN number of the Short Message Service Centre (SM-SC), from which the SM was sent;

- in the "sMSAck or sMSNack" parameter, the SM result (i.e. a SMS_DELIVER REPORT_TL message containing the response of the user to the SMS_DELIVER or a SMS_STATUS_REPORT TL message sent by the SM_SC. In case of a positive result, the sMSAck parameter shall be used, in case of a negative result, the sMSNack parameter shall be used.;

- optionally, in the "additions" parameter, information for network specific use.

On receipt of the correctly encoded SMSDeliver return result component, the network shall send the positive SMS Deliver indication to the SM-SC and shall not respond to the receiving SMS user.

7.6.2   Exceptional procedure

If the receiving SMS user has received a SMSDeliver invoke component, which is not acceptable for the user, the user shall send a SMSDeliver return error component to the network within a facility information element, using the procedures described in clause 8.3.2.2 of EN 300 196-1 [1], indicating the following error value:

- "invalidServedUserNr", if ISDN number of the SMS user from whom the SM was sent is invalid, not acceptable or missing;

- "invalidSM_SCNr", if the receiving SMS user does not recognize the provided number of the SM-SC;

- "invalidReceivingUserNr", if the SMS user receives a receiving user number which is seen as invalid by the user;

- "sMSRejected", if the SMS is not accepted by the receiving user for any reason;

- "resourceUnavailable", if the receiving user does not have the resources (e.g. the application is not able to process the received SMS) to receive the SM.

On receipt of the SMSDeliver return error component, the network shall consider, that the SM delivery to the receiving user has failed.

If a reject component is received by either the SMS user or the network and the invoke identifier is included, the reject component shall be ignored.

7.7   Interrogation

Interrogation is a service provider option. Interrogation is performed between the SM-TE and the SM-SC. Interrogation information exchanged between the SM-TE and the SM-SC is transferred in one or more SMs (sMSSubmit invoke and sMSDeliver invoke component, see figure 2).

8   Procedures for interworking with private ISDNs

The SMservice shall be provided to the whole private ISDN access. For activation, deactivation, invocation and interrogation of the SMservice at the T reference point, the procedures in clause 7 of the present document shall apply, except that the SMS service components shall be transported according to clauses 8.3.2.1.1 and 8.3.2.1.3 of EN 300 196-1 [1].

9   Interactions with other networks

No impact.

10   Interactions with supplementary services

The interaction of SMservice with supplementary services shall be as specified in ES 201 986 [10].

11   Parameter values (timers)

Not applicable (there is no activation, deactivation and interrogation invoke component; these functions are controlled with command strings within the sMSData structure).

Annex A (informative):
Signalling flows

originating SMS user   SMS network   receiving SMS user

FACILITY(DCR)
[FIE:sMSSubmit-inv
(sMSData<SMS_SUBMITINTERROGATION>)]

FACILITY(DCR)
[FIE:sMSSubmit-rr (SMSAckData<
sMS_SUBMIT_REPORT>)]

FACILITY(DCR)
[FIE: sMSDeliver-inv(
sMSData<SMS_DELIVER(INTERROGATION
RESPONSE)>)]

FACILITY(DCR)
[FIE: sMSDeliver-rr(SMSAck<
SMS_DELIVER_REPORT>)]
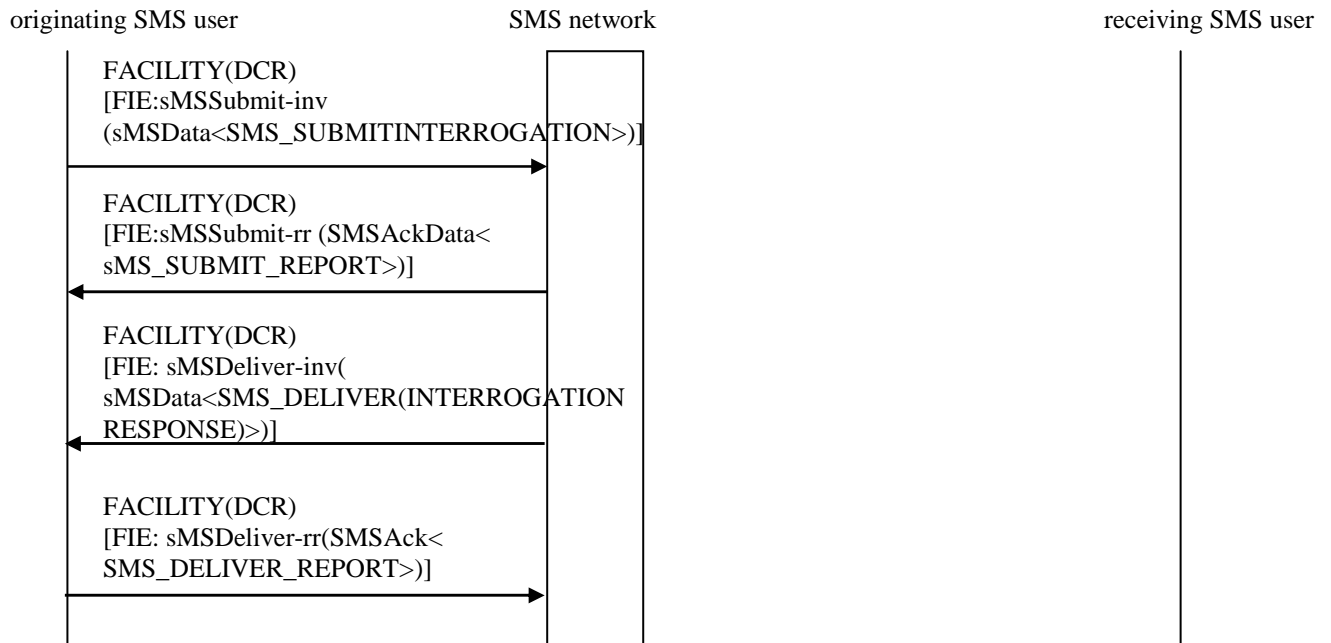
Figure A.1: Interrogation of the SMS status by the SMS user

originating SMS user   SMS network   receiving SMS user

FACILITY (DCR)
[FIE:sMSSubmit-inv (sMSData<
SMS_SUBMIT(ACTIVATE/DEACTIVAT
E)>)]

FACILITY (DCR)
[FIE:sMSSubmit-rr
(sMSAck<SMS_SUBMIT_RE
PORT>)]

FACILITY (DCR)
FIE:sMSDeliver-inv
(sMSData<SMS_DELIVER(ACTIVATE/
DEACTIVATE_RESPONSE>)]

FACILITY (DCR)
FIE:sMSDeliver-rr(SMSAck<
SMS_DELIVER_REPORT>)]
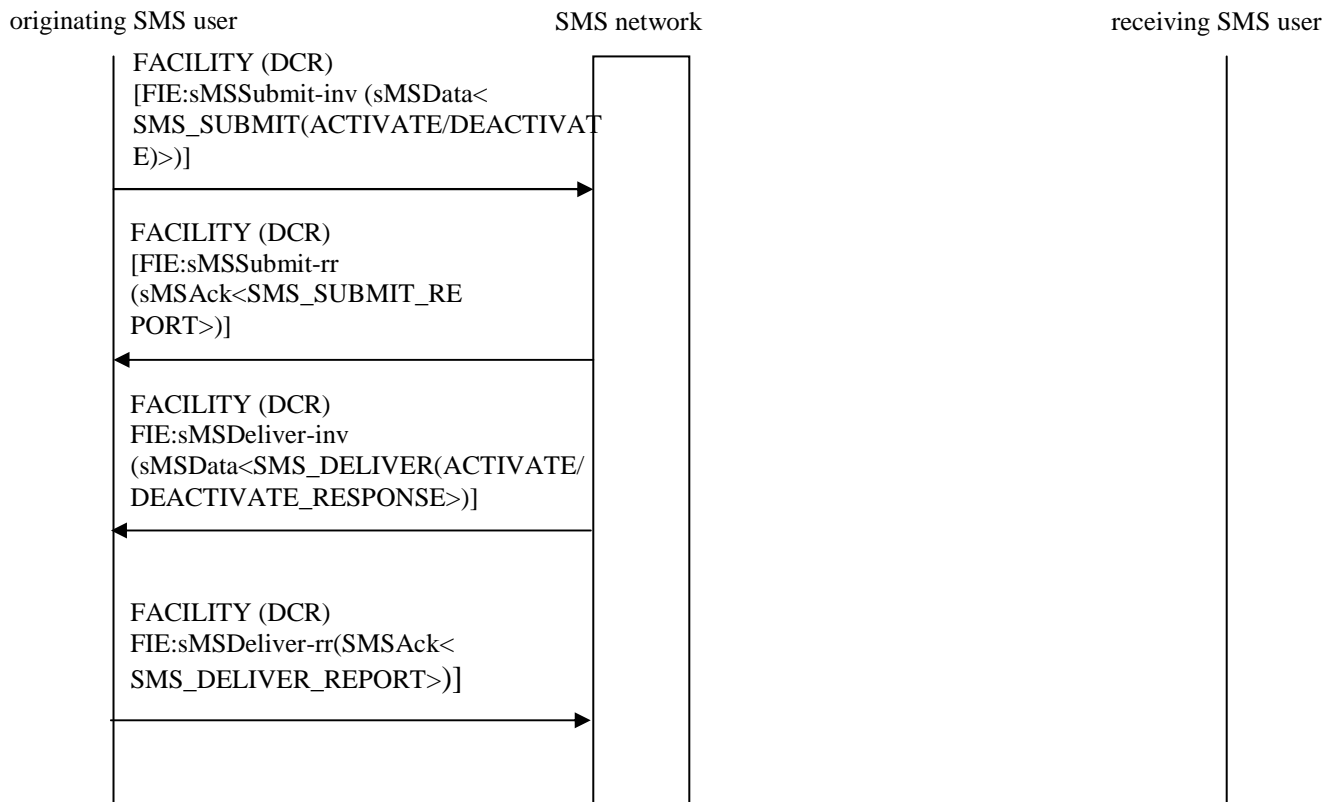
**Figure A.2: Activation and Deactivation of the SMservice by the SMS user
at the originating SMS user side**

originating SMS user   SMS network   FACILITY (DCR)   receiving SMS user
                                                       [FIE: sMSSubmit -inv
                                                       (sMSData<SMS_SUBMITDEACT_RECEPT>)]

                                                       FACILITY (DCR)
                                                       [FIE: sMSSubmit -rr
                                                       (sMSAck<SMS_SUBMIT_REPORT>)]

                                                       FACILITY (DCR)
                                                       [FIE: sMSDeliver-inv
                                                       (sMSData<SMS_DELIVER(DEACT_RECEPT_RESPONSE)>)]

                                                       FACILITY (DCR)
                                                       [FIE: sMSDeliver-rr
                                                       (sMSAck<SMS_DELIVER_REPORT)>]

                                                       FACILITY (DCR)
                                                       [FIE: sMSSubmit-inv
                                                       (sMSData<SMS_SUBMIT(ACTIVATE)>)]

                                                       FACILITY (DCR)
                                                       [FIE: sMSSubmit-rr
                                                       (sMSAck<SMS_SUBMIT_REPORT)>]

                                                       For confirmation of the reactivation,
                                                       see figure A.2
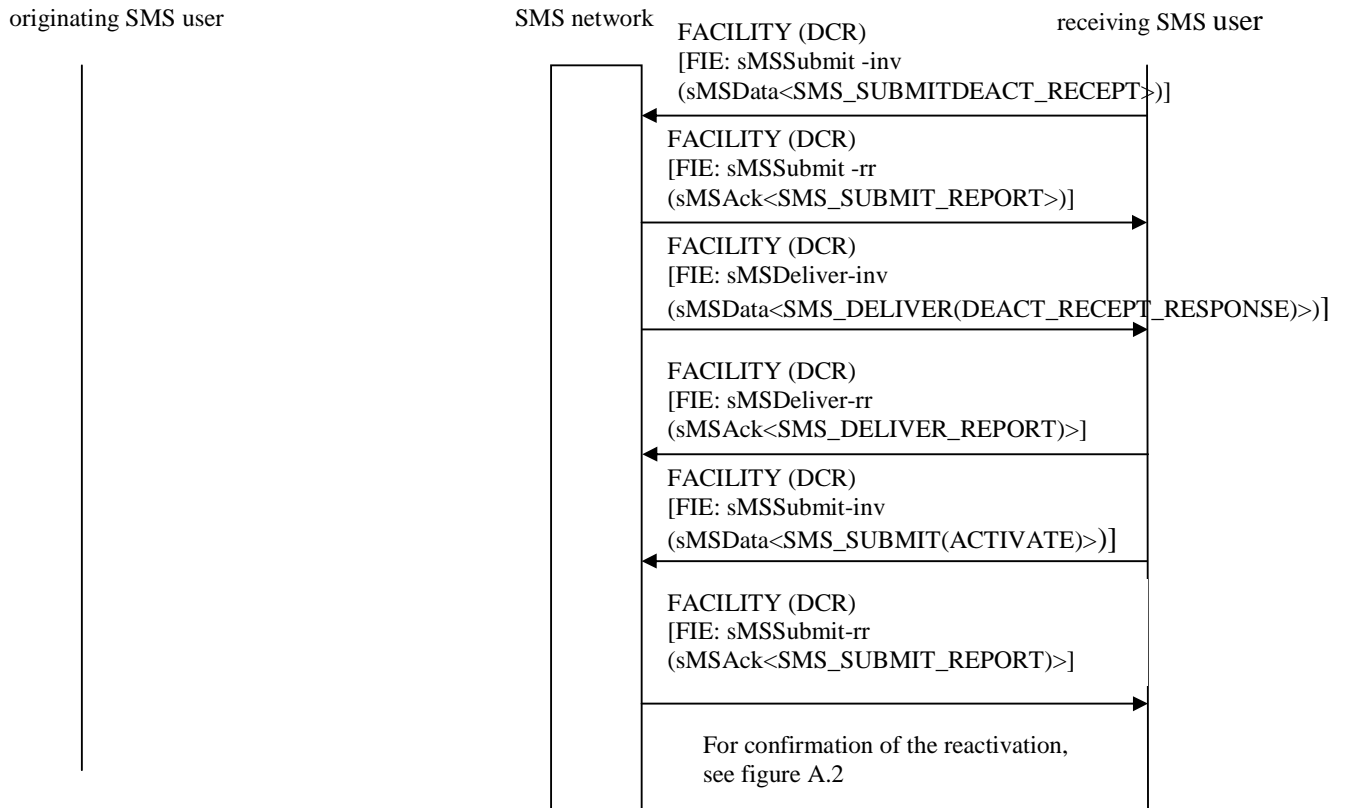
**Figure A.3: Deactivation of the reception of SMs by the receiving user and
re-activating of reception of SMs**

originating SMS user   SMS network   receiving SMS user

   FACILITY (DCR)
   [FIE: sMSSubmit-inv(sMSData<SMS_SUBMIT(Text, etc.)>)]

   FACILITY (DCR)
   [FIE: sMSSubmit-rr
   (sMSAck<SMS_SUBMIT_REPORT>)]]

**Figure A.4: Sending of a SM from the originating SMS user to the network and
response from the network**

originating SMS user   SMS network   receiving SMS user

FACILITY (DCR)
[FIE: sMSDeliver-inv
sMSData<SMS_DELIVER(Text, etc.)>)]]

FACILITY (DCR)
[FIE: sMSDeliver -rr
(sMSAck<SMS_DELIVER_REPORT>)]
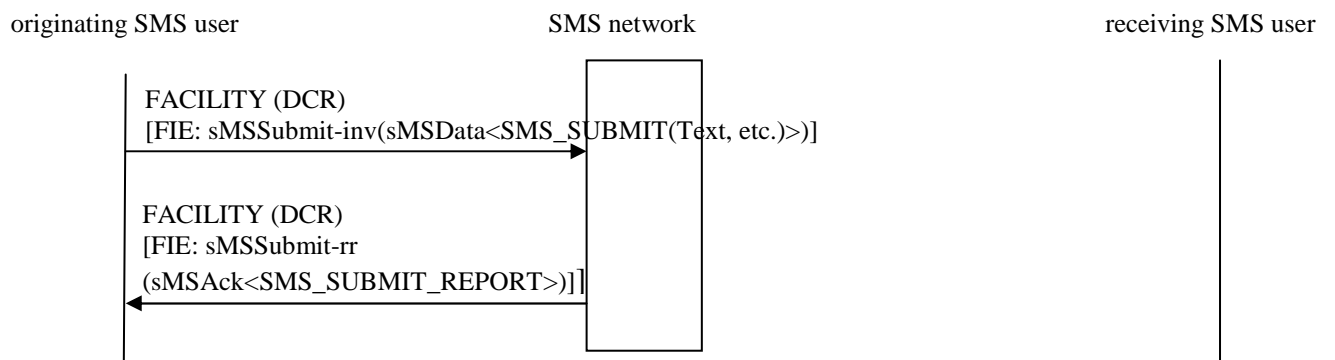
FACILITY (DCR)
[FIE: sMSDeliver-inv
(sMSData< STATUS_REPORT>)]

FACILITY (DCR)
[FIE:sMSDeliver-rr
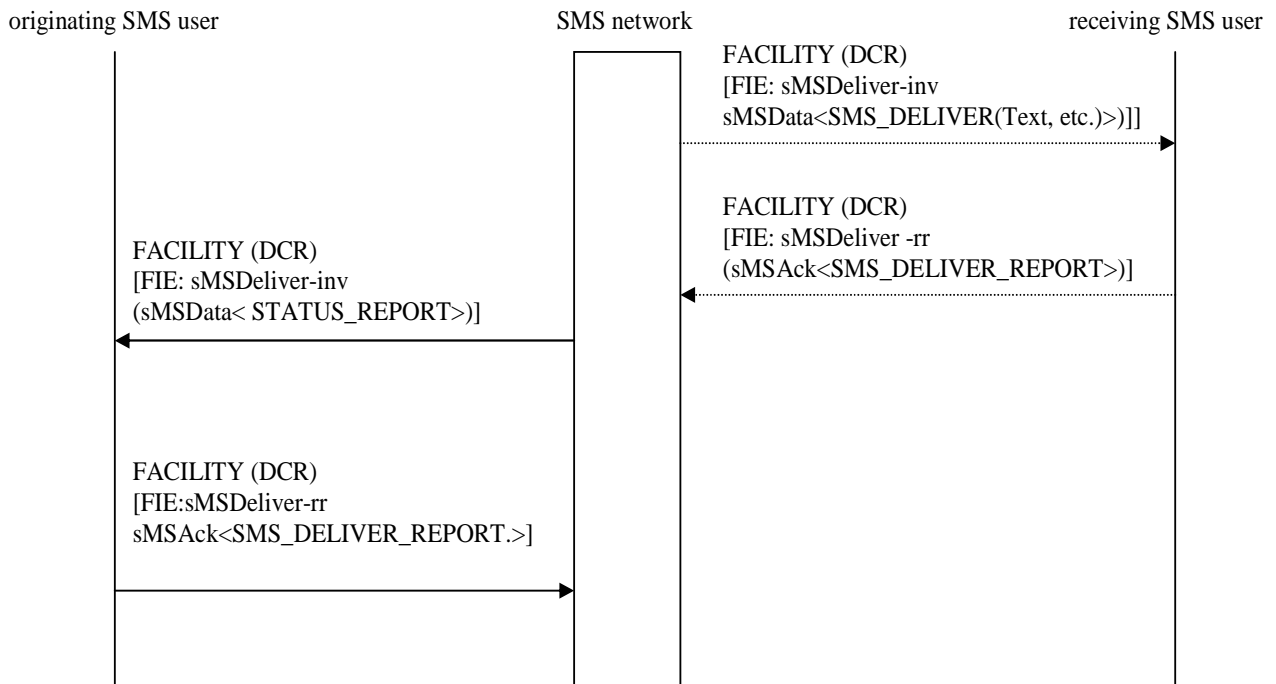sMSAck<SMS_DELIVER_REPORT.>]

**Figure A.5: SMS user has requested a Status report and
the network sends the Status_report to the SMS user**

originating SMS user   SMS network   receiving SMS user

FACILITY (DCR)
[FIE: sMSDeliver-inv
(SMSData<SMS_DELIVER(Text, etc.)>)]

FACILITY (DCR)
[FIE: sMSDeliver_rr
(sMSAck<SMS_DELIVER_REPORT>)]]

FACILITY (DCR)
[FIE: sMSDeliver-inv
(SMSData< STATUS_REPORT>)]

FACILITY (DCR)
[FIE:sMSDeliver-rr
(sMSAck<SMS_DELIVER_REPORT>)]

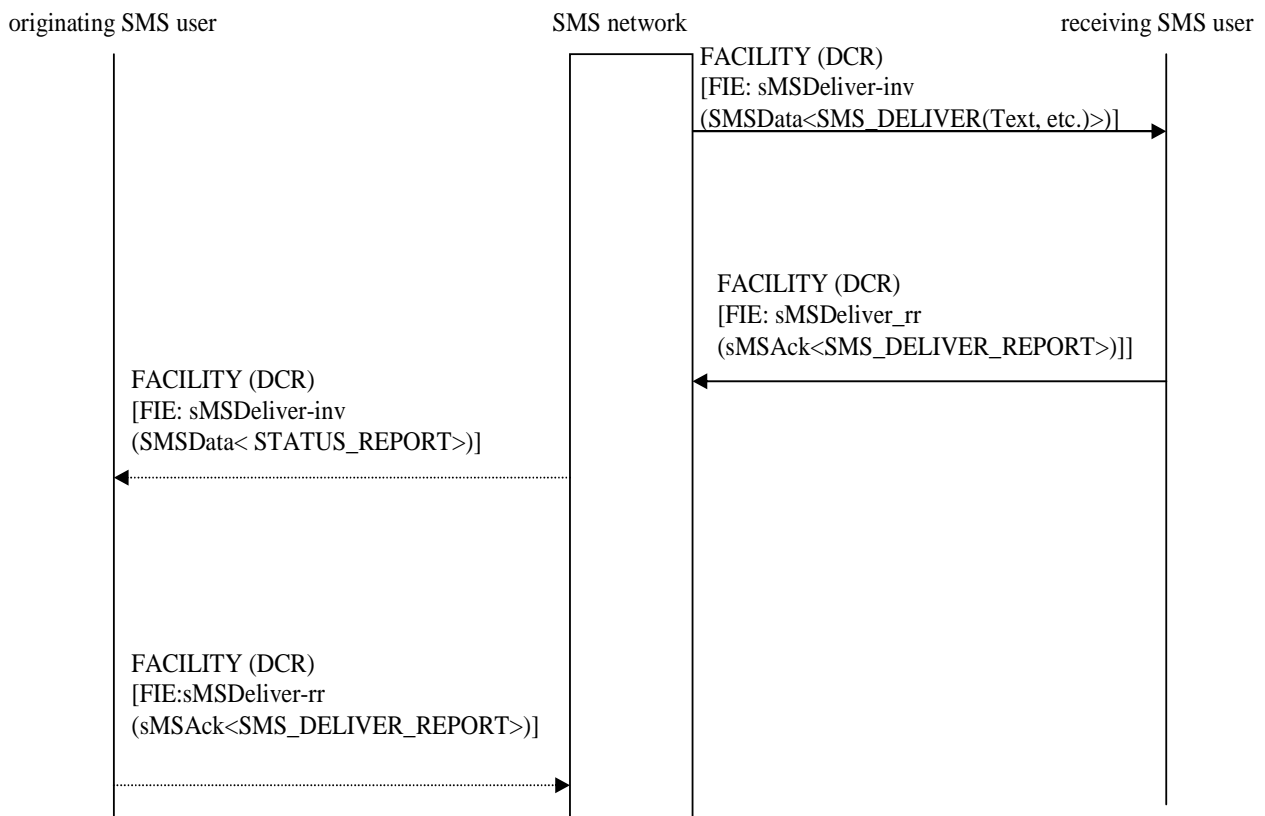**Figure A.6: The network delivers the SM to the receiving user; the receiving user acknowledges
the receipt of the SM with a SMSDeliver_return result**
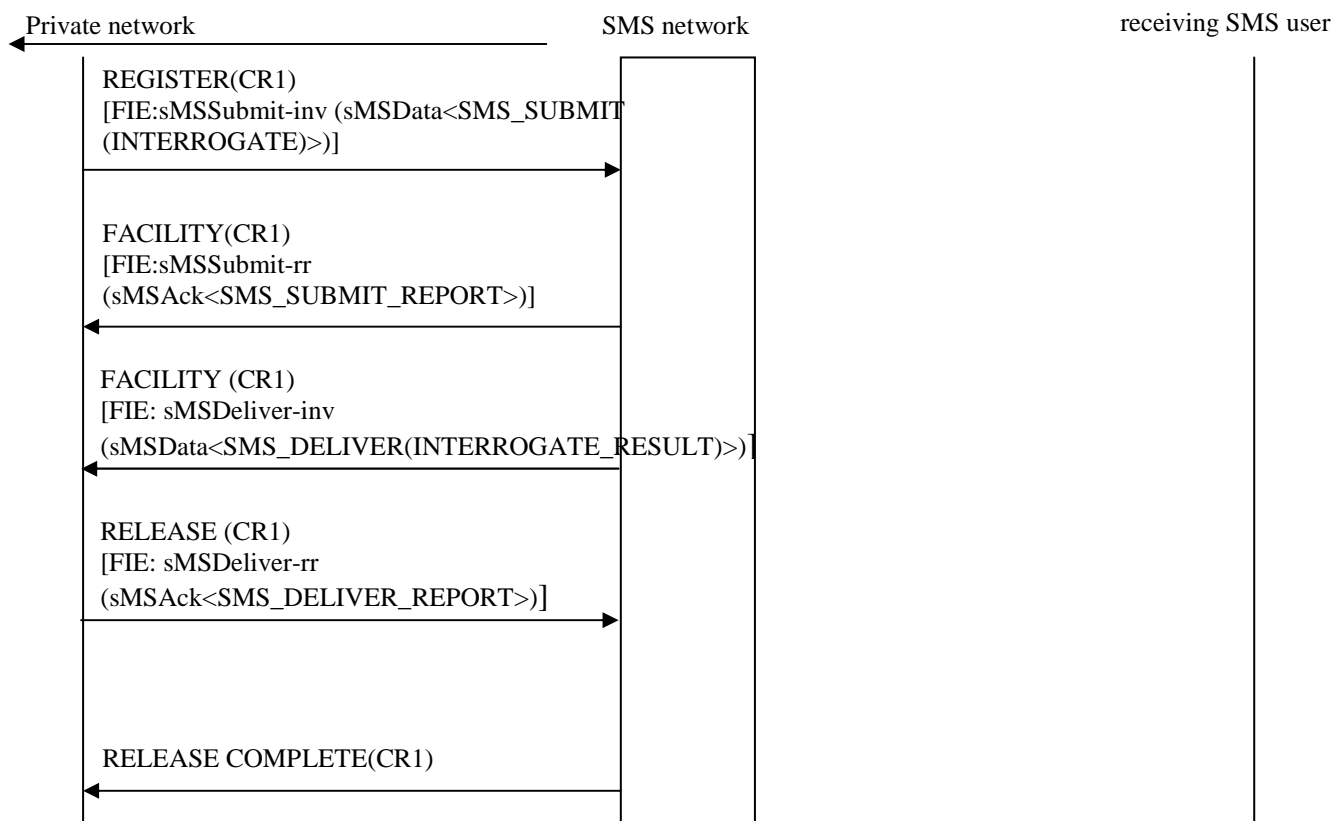
ETSI

Private network   SMS network   receiving SMS user

REGISTER(CR1)
[FIE:sMSSubmit-inv (sMSData<SMS_SUBMIT
(INTERROGATE)>)]

FACILITY(CR1)
[FIE:sMSSubmit-rr
(sMSAck<SMS_SUBMIT_REPORT>)]

FACILITY (CR1)
[FIE: sMSDeliver-inv
(sMSData<SMS_DELIVER(INTERROGATE_RESULT)>)]

RELEASE (CR1)
[FIE: sMSDeliver-rr
(sMSAck<SMS_DELIVER_REPORT>)]

RELEASE COMPLETE(CR1)

Figure A.7: Interrogation of the SMS status where the SMS user is within a private network

Private network   SMS network

REGISTER(CR1)
[FIE:sMSSubmit-inv
(sMSData<SMS_SUBMIT(ACTIVATE/DEACTIVATE)>)]

FACILITY(CR1)
[FIE:sMSSubmit-rr (sMSAck<SMS_SUBMIT_REPORT>)]

FACILITY (CR1)
[FIE: sMSDeliver-inv
(sMSData<SMS_DELIVER(ACTIVATE/DEACTIVATE_RESPONSE)>)]

RELEASE(CR2)
[FIE:sMSDeliver-rr
(sMSAck<SMS_DELIVER_REPORT >)]

RELEASE COMPLETE(CR1)
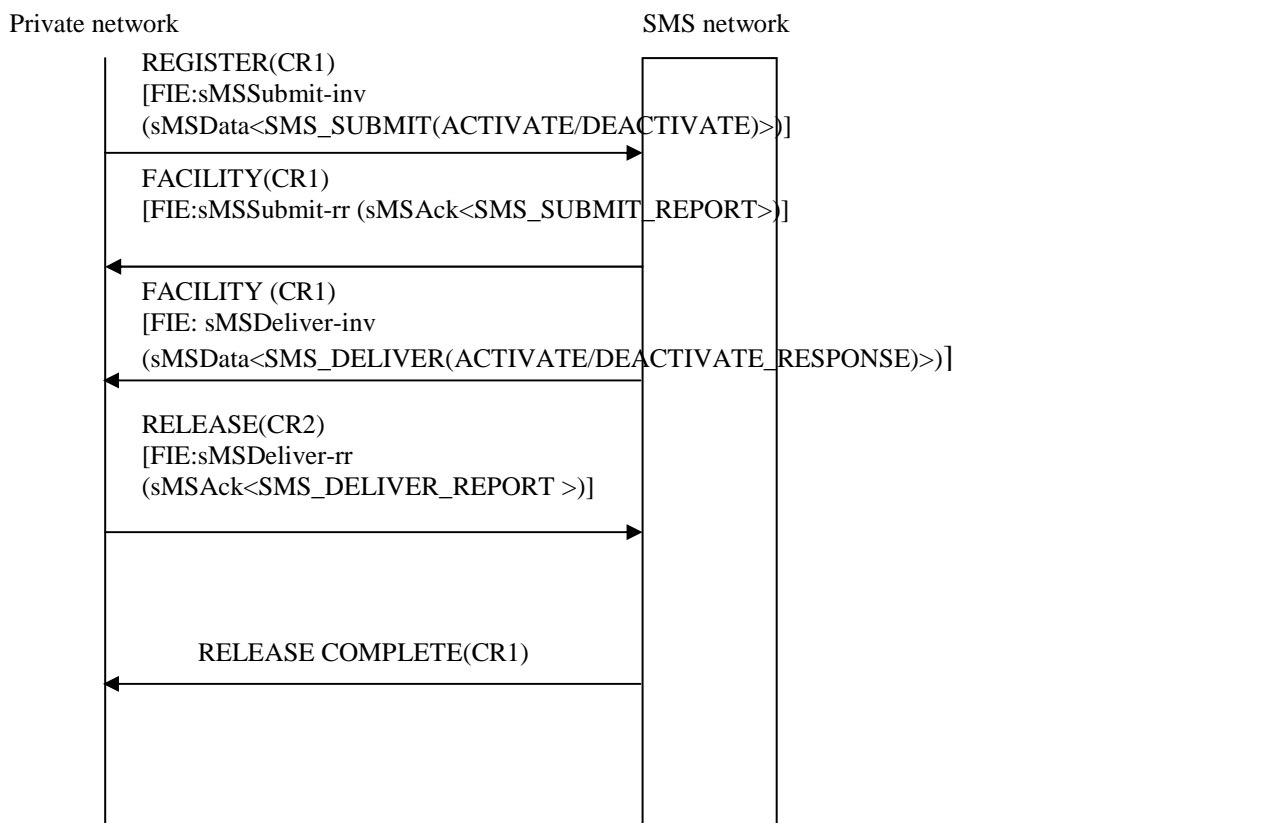
**Figure A.8: Activation and Deactivation of the SMservice
where the SMS user is within a private network**

originating SMS user   SMS network   Private network

REGISTER(CR1)
[FIE:sMSSubmit -inv
(SMSData<SMS_SUBMIT(DEACT_RECPT)>)]

FACILITY(CR1)
[FIE:sMSSubmit -rr
(SMSAck<SMS_SUBMIT_REPORT>)]

FACILITY (CR1)
[FIE: sMSDeliver-inv
(sMSData<SMS_DELIVER(DEACT_RECPT
_RESPONSE)>)]

RELEASE (CR1)
[FIE: sMSDeliver-rr
(sMSAck<SMS_DELIVER_REPORT>)

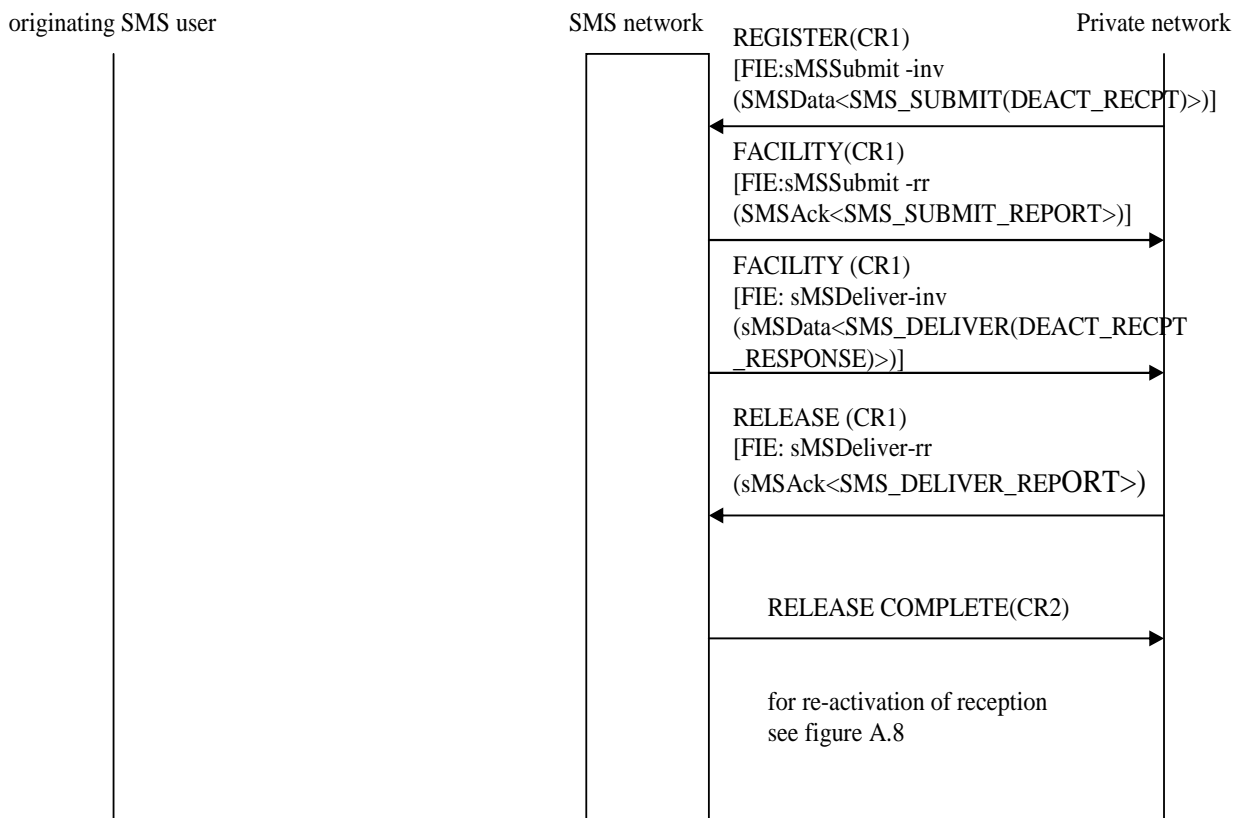RELEASE COMPLETE(CR2)

for re-activation of reception
see figure A.8

**Figure A.9: Deactivation of the reception of SMs by the receiving user located
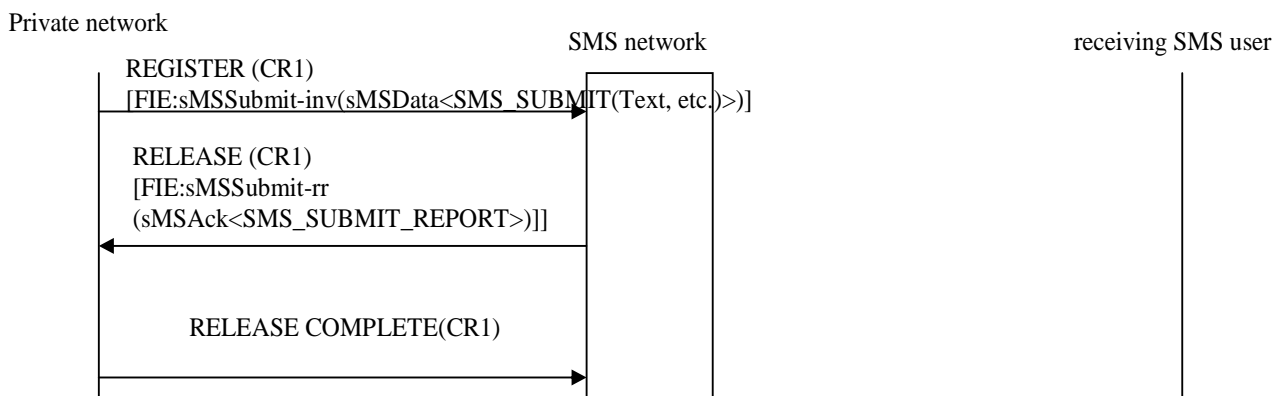within a private network and re-activation of the reception of SMS**

Private network   SMS network   receiving SMS user

REGISTER (CR1)
[FIE:sMSSubmit-inv(sMSData<SMS_SUBMIT(Text, etc.)>)]

RELEASE (CR1)
[FIE:sMSSubmit-rr
(sMSAck<SMS_SUBMIT_REPORT>)]]

RELEASE COMPLETE(CR1)

**Figure A.10: Sending of a SM from a SMS originating user
within a private network to the SMS network**

Private network   SMS network   receiving SMS user

REGISTER(CR1)
[FIE:sMSDeliver-inv
(sMSData<STATUS_REPORT>)]

RELEASE (CR1)
[FIE: sMSDeliver-rr
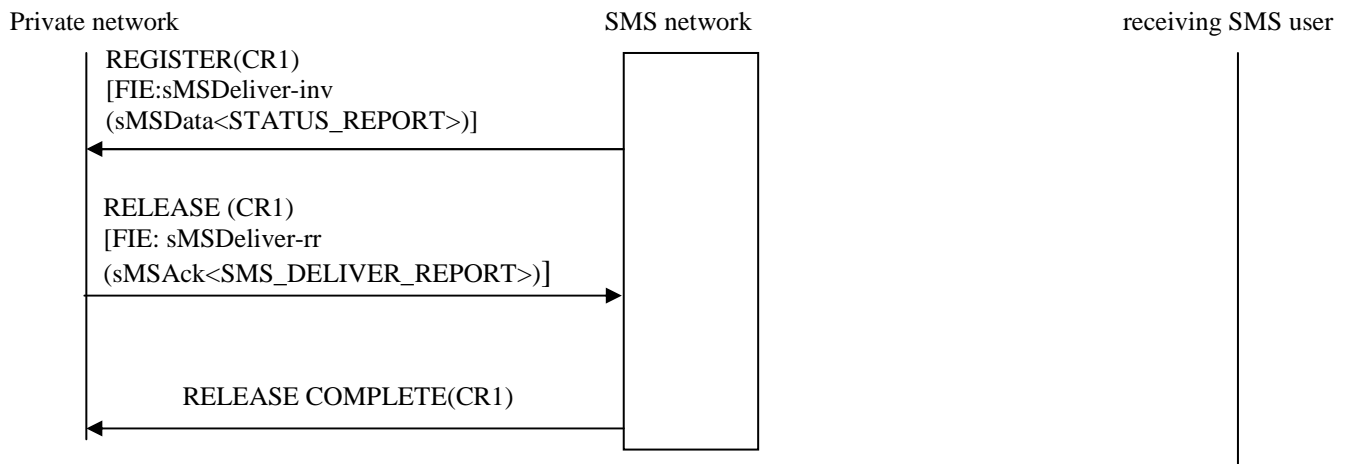(sMSAck<SMS_DELIVER_REPORT>)]

RELEASE COMPLETE(CR1)

Figure A.11: SMS user within a private network has requested a SMSStatus report in the SMSSubmit invoke component and the SMS network sends the SMSStatus_report to the SMS user within the private network
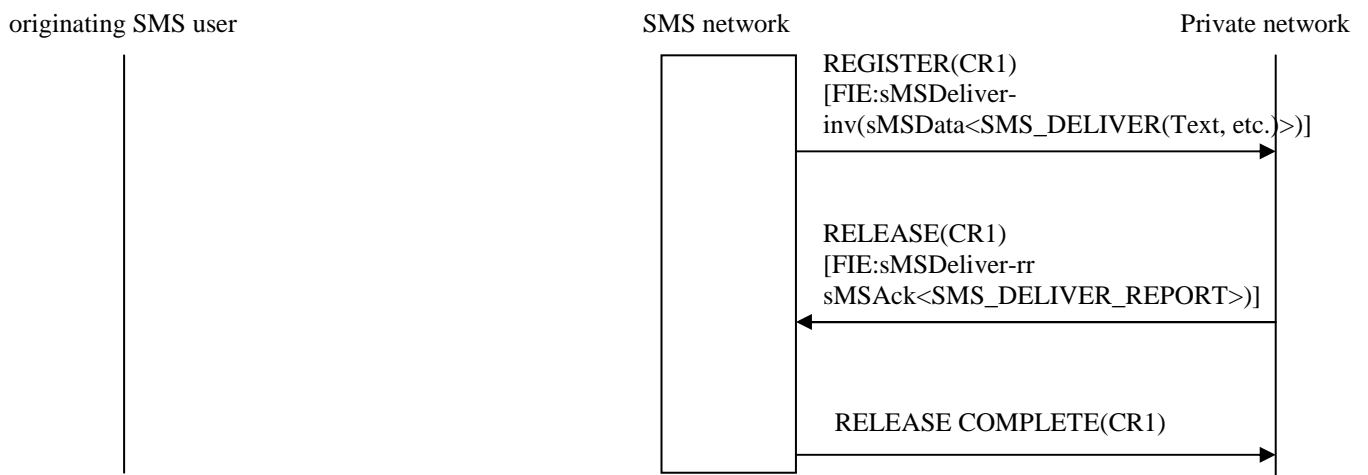
originating SMS user   SMS network   Private network

REGISTER(CR1)
[FIE:sMSDeliver-
inv(sMSData<SMS_DELIVER(Text, etc.)>)]

RELEASE(CR1)
[FIE:sMSDeliver-rr
sMSAck<SMS_DELIVER_REPORT>)]

RELEASE COMPLETE(CR1)

Figure A.12: The SMS network delivers the SM to the receiving user within the private network; the private network confirms the receipt

Annex B (informative):
Structure of the SMS information in DSS1

The Short Message Service (SMS) data (containing a TL PDU which itself contains e.g. SMS text and commands) transmitted by the SM-TE or SM-SC are structured according to figure B.1 and transported in the SMSData in the SMSSubmit and SMSDeliver invoke component and in the SMSAck or SMSNack in the respective return result component within the facility information element between the SM-TE and the SM-SC.
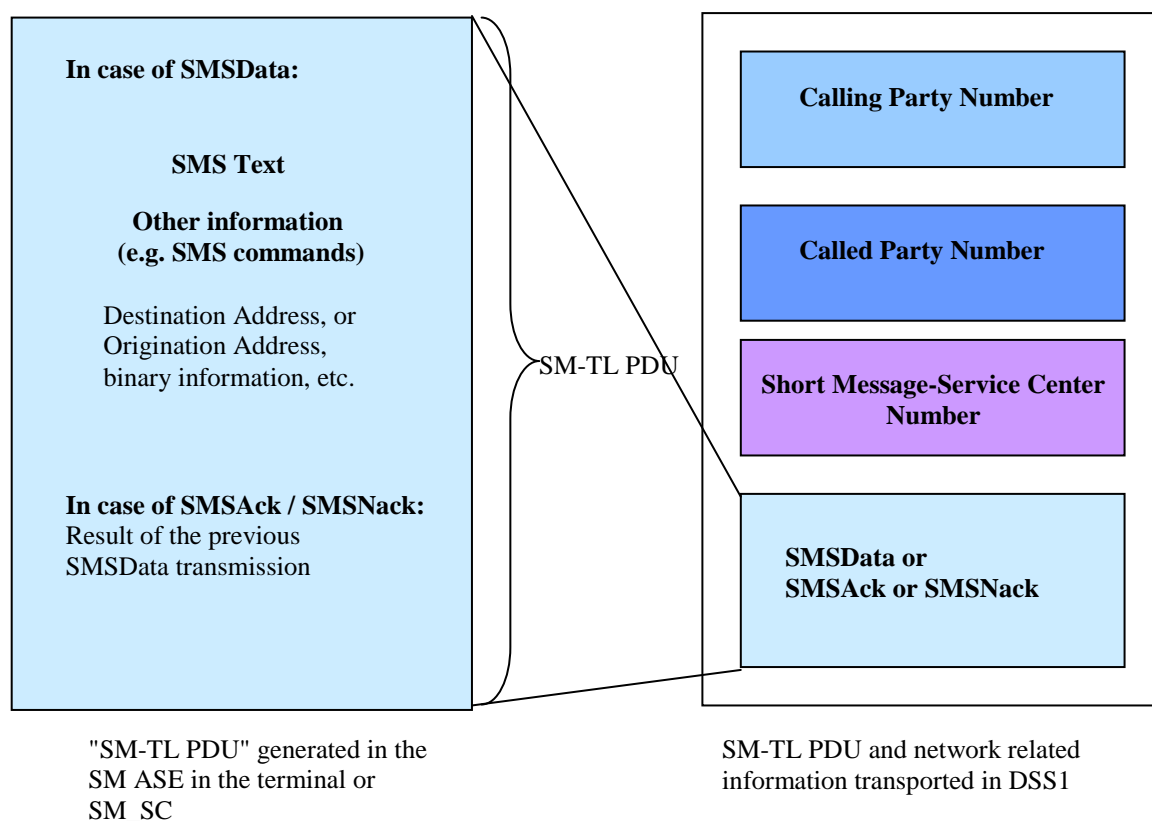

Figure B.1: Structure of the SMS information in DSS1

The SM-TE generates the SM-Transfer Layer Protocol Data Units (SM-TL PDU) according to TS 123 040 [11], or ES 201 912; all SMS specific commands are provided within the SM-TL PDUs [13].

In addition to the SM-TL PDU, the calling party number (number of the served user, in GSM the originating address) and the called party number (number of the receiving user, in GSM the destination address) and the Short Message Service Centre Number shall be provided by the SM-TE outside the SM-TL PDU and transported in DSS1.

Annex C (informative):
Assignment of object identifier values

The following object identifier values are assigned in the present document:

```
{itu-t identified-organization etsi(0) xyz operations-and-errors(1)}

{itu-t identified-organization etsi(0) xyz operations-and-errors(1) 1}
{itu-t identified-organization etsi(0) xyz operations-and-errors(1) 2}

{itu-t identified-organization etsi(0) xyz operations-and-errors(1) 10}
{itu-t identified-organization etsi(0) xyz operations-and-errors(1) 11}
{itu-t identified-organization etsi(0) xyz operations-and-errors(1) 12}
```

Annex D (informative):
Bibliography

ETSI EN 300 195-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Supplementary service interactions; Part 1: Protocol specification".

ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

ETSI EN 301 002-1 V.1.3.1: "Integrated Services Digital Network (ISDN); Security tools (SET) procedures; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

History

Document history			
V1.1.1	March 2003	Membership Approval Procedure	MV 20030502: 2003-03-04 to 2003-05-02