

Guidelines for calls to the emergency number in Sweden

An Application Guide describing the interfaces and procedures for dialling and routing of emergency calls from public communications networks to the emergency services

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Introduction

This Application Guide describes the interfaces and procedures to be used by public communications operators for calls to the emergency services using the number 112¹.

This Application Guide describes available interfaces, procedures for dialling and routing of emergency calls in different call cases, information to be transferred in the emergency call, guidelines for setting of Municipality Identity Codes and testing of the emergency call service. The Application Guide refers to the Electronic Telecommunications Act² and the Regulation concerning Emergency Calls³.

The Application Guide describes SOS-NTP based on signalling system no.7 (ISUP). SOS-NTP based on SIP is described in draft ITS 25.

The Application Guide does not deal with the corresponding internal information that might be used in each operator's network.

The document is concerned with technical issues and is assumed to be used by public communications operators in their agreements on interconnection to other public communications operators or directly to the emergency services.

Public communications networks are interconnected to enable the subscribers in the different networks to call the public emergency service. The public communications operators can connect either directly to the SOS-NTP interface or via another transit public communications network. (See Figure 1).

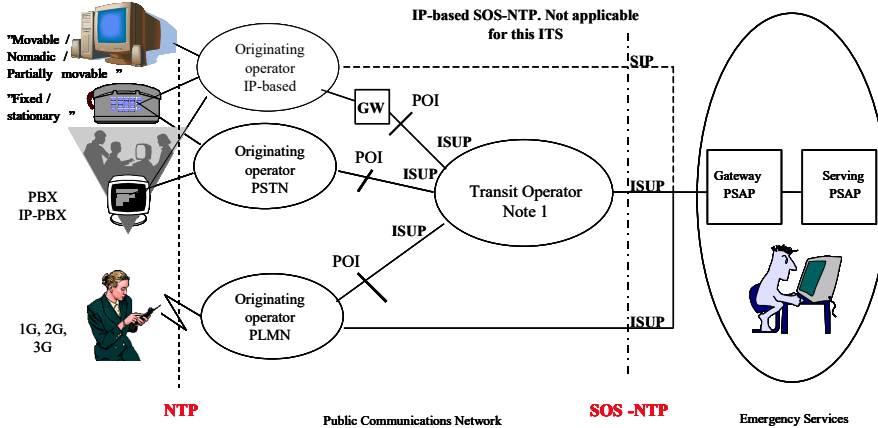


Figure 1

Note 1: At present, TeliaSonera is the sole network operator in Sweden providing Transit Operator connections to SOS-NTP

¹ The old emergency number 90 000 can still be used in some networks.
² Lagen om Elektronisk Kommunikation, LEK (2003:389)
³ PTSFS 2002:4: Förmedling av nödsamtal till samhällets alarmeringstjänst

Scope

It must be possible to set up calls from subscribers and users connected to different public communications networks to the public emergency services. The purpose of the Application Guide is to give public communications operators guidelines in their setting up of the emergency call service.

This Application Guide:

- Describes the interfaces to be used for connection to the public emergency services;
- Describes the supported dialling patterns for emergency calls;
- Describes the different routing cases for emergency calls;
- Describes information to be transferred in the emergency call;
- Includes guidelines for setting of the Municipality Identity Code transferred in the emergency call;
- Describes testing of emergency calls;
- Is applicable for national interconnect ISUP between public communications networks based on SS 63 63 93;
- Is not applicable for any IP-based connection regarding the SOS NTP.

1 References

1.1 Normative references

The following normative documents contain provisions, which through reference in this text constitute provisions of this Application Guide. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this Application Guide are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to, apply.

ITS 9 edition 3 2006-10-13	Transfer of number information in national interconnection based on ISUP
ITS 21 edition 1 2006-10-08	Routing of calls to emergency numbers 112 and 90 000 using the Identification Plan of Municipalities
draft ITS 25 edition 1 2007-02-06	Guidelines for calls to emergency numbers 112 and 90 000 in Sweden using IP-interconnection
Post & Telestyrelsen 2006-04-13	Sammanställning av svensk nummerplan för telefoni (in Swedish only)
PTSFS 2002:4	Föreskrifter om förmedling av nödsamtal till samhällets alarmeringstjänst (in Swedish only)
PTSFS 2005:3	Föreskrifter om skyldighet att lämna ut abonnentuppgifter (in Swedish only)
SFS 2003:389	Lagen om Elektronisk Kommunikation
SS 63 63 93:2000, edition 1	PSTN-ISDN-PLMN ISUP signalling interface for Sweden
SS 63 63 94:2004, edition 1	Positioning of Mobile Terminals at Emergency Calls
ITU-T Recommendation E.164	The international public telecommunication numbering plan

(02/05)

ITU-T Recommendation E.214 (02/05) Structure of the land mobile global title for the signalling connection control part (SCCP)

1.2 Informative references

www.112.se Information concerning the use of the emergency number 112.

2 Terms and definitions

2.1 Gateway PSAP

The first PSAP an emergency call is connected to from the public communications network.

2.2 Municipality Identity Code

A code from the Identification Plan of Municipalities, (Kommun-ID-planen) for calls to the emergency number 112.

2.3 Originating Operator Network

The public communications network providing the access for the originating call.

2.4 Serving PSAP

The PSAP serving the area of the emergency situation.

2.5 Transit Operator Network

The network of an operator transferring calls between two other operators' networks or to the PSAP from the originating operators network.

3 Symbols and abbreviations

CLI	Calling Line Identity
GW	Gateway
IP	Internet Protocol
IP-PBX	IP-protocol based PBX
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MSC	Mobile Switching Center
NTP	Network Termination Point
PBX	Private Branch Exchange
PLMN	Public Land Mobile Network
POI	Point Of Interconnection
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
SIP	Session Initiation Protocol

4 General description of mandatory and optional information

The operation of efficient emergency services requires that necessary information concerning the caller is made available. The mandatory information components are:

- o Calling Line Identity
- o Caller Location

An Originating Operator has the obligation to convey an emergency call even if any of the mandatory information components is not available. Concerning how Caller Location can be made available to the emergency services, see section 4.2.

4.1 Calling line identity

The Calling Line Identity, CLI is used by the emergency services for two purposes.

1. Make it possible for the emergency operator to call back
2. Can be used for finding the address and/or location of the caller (see 4.2)

The CLI shall always be transferred without modification through the network and over the SOS NTP irrespective of the setting of the parameters Calling Line Identification Presentation, CLIP or Calling Line Identification Restriction, CLIR

4.2 Caller Location

Location of the caller is used for two purposes.

1. Facilitate routing of an emergency call to the appropriate PSAP.
2. Geographical location of the caller enabling sending of rescue team to the right place.

A fixed telephone normally has a geographical address (e.g. street) and might also have coordinates representing the same address. A mobile telephone might have a billing address that is geographical (e.g. street), but also a location, which normally is not the same as the billing address.

4.3 Routing information

Routing information is used to route the emergency call to the appropriate PSAP. The routing information is assigned to the emergency call in the Originating Operator network. The correct routing can be achieved in different ways. Concerning assignment of Municipality Identity Codes, the user or the network can assign them. In the case they are assigned by the user, e.g. a corporate network, the Originating Operator network cannot guarantee routing to the appropriate PSAP. In the case the assignment is done by the Originating Operator, the Municipality Identity Code shall represent the NTP.

The procedure for assignment and routing is summarized below.

1. The User or the Originating Operator network assigns the routing information
2. If applicable, a transit network transfers and uses the routing information
3. The Gateway PSAP receives the routing information

4.4 Geographical address information

Geographical address information is used by the emergency operator for location of the caller. It can be a geographical address, e.g. street name and number or a position expressed in coordinates.

The address can be retrieved using two methods.

1. The CLI is used as an identifier in a request to a database where mapping of CLI into address or location (for mobile terminals⁴) is made available.
2. The address information is received in the incoming emergency call⁵.

The geographical address can be of two types:

- a. NTP of a telephone line,
- b. Address related to the subscription that might be home or billing address of subscriber.

4.5 Other information (Informative)

Subscriber information can be used by the emergency operator for improvement of the emergency service. The subscriber information can be retrieved using two methods.

1. The CLI is used as an identifier in a request to a database where mapping of CLI into subscriber information is made available.
2. The subscriber information is received in the incoming emergency call

The subscriber information can be of different types. Some examples are given below

- a. Personal Identification Number or Organisation Number
- b. Name of subscriber or company
- c. Type of subscription (E.g. subscriber line, PBX)
- d. Type of access (PSTN, PLMN, IP)
- e. Unlisted (ex-directory) number

For further examples see PTSFS 2005:3.

5 Protocols for connection to the emergency services

5.1 General

A public communications network operator can either connect to the emergency services directly or transit via another public communications operator. In both cases there are two protocols that can be used:

1. ISUP
2. SIP (described in draft ITS 25)

In this Application Guide only ISUP connection is described.

5.2 Transfer of information using ISUP

To make it possible for the emergency services to get the necessary information described in chapter 4, the following information has to be transferred in ISUP.

Element	Transferred in
Mandatory information	
Calling Party Number (A-number in national or international E.164 format)	Calling Party Address parameter in the Initial Address Message
Called Party Number	Called Party Address parameter in the

⁴ See SS 63 63 94

⁵ Not applicable for the signalling system no.7 (ISUP). SOS-NTP.

(B-number in national E.164-format)	Initial Address Message
Geographical reference (Identity of MSC in E.214-format. See SS636394)	Location Number parameter in the Initial Address Message
Note 1	Note 1

Table 1 Information elements using ISUP

Note 1: This field is only generated for emergency calls from mobile telephones

6 Interconnection using ISUP

When interconnection over ISUP is chosen, three information elements are mandatory in the signalling interface.

1. Calling Party Number (for all types of calls)
2. Called Party Number
3. Location Number (for calls from mobile terminals)

Detailed information about setting of parameters in the Initial Address Message is given below.

6.1 Calling Party Number

Shall always be present when the A-number is available at the Originating Operator network.

Coding of the parameter shall be according to SS 63 63 93 with Nature Of Address indicator, NOA = 3 or 4, and Numbering Plan Indicator, NPI = 1.

6.2 Called Party Number

To establish a call over two networks, the Called Party Number must be transferred across the POI interface. The Called Party Number is a mandatory parameter and is the information used to identify the called party. It shall be applied according to Table 2.

Subfield name	Subfield value
Odd/ even indicator	odd/ even
Nature Of Address indicator	3 (National (significant) number)
Internal network number indicator	allowed/not allowed
Numbering Plan Indicator	1 (E.164)
Address signals	379 112 XYZ Note 1

Table 2 Called Party Number parameter and settings for 112-calls

NOTE 1: 379 Routing number for short codes 11X
112 Short code for public emergency service
XYZ Municipality Identity Code i.e. geographical origin of call
according to ITS 21 ed 1

This type of number information is sent across POI with a subscriber dialling:

The emergency number 112 according to 6.1.3. ←

The subfields Nature Of Address and Address signals shall be applied as shown in Table 2. It does not matter if a subscriber has dialled 112 or 90 000 for the public emergency service. The originating operator shall replace the dialled number with a number according to table 2.

6.3 Dialling patterns

The following dialling patterns shall be supported:

- 112

Mobile phones and other terminals (notebook, PC etc) may support more types of procedures.

In this Application Guide only ISUP connection is described.

6.4 Location Number

The use of the parameter Location Number for mobile calls is described in SS 63 63 94, chapter 7.3.

7 Procedures for routing of emergency calls

The originating user or Originating Operator network has to assign the correct Municipality Identity Code. The code has two purposes:

- 1 Route the emergency call to the appropriate PSAP
- 2 Convey information to the Serving PSAP concerning geographical location and type of access the emergency call was made from

The setting of the Municipality Identity Code and the rules for routing are described in ITS 21 edition 1.

8 Testing of emergency calls

The possibility to test emergency calls is important to ascertain that an emergency call can be established, is routed correctly and conveys the expected information. The use of separate Municipality Identity Codes for tests are intended for system tests when setting up a telecommunications service. Testing of real emergency calls should preferably be done using non-test Municipality Identity Codes and after agreement with one or more PSAPs.