

Assignment of SS7 National Signalling Point Codes (NSPC, NI=3)

An Application Guide for the assignment of SS7 National Signalling Point Codes (used in signalling network NI=3) used between national public electronic communications networks

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Introduction

This Application guide is released in edition 1 due to the transfer of the responsibility for the assignment of SS7 National Signalling Point Codes (NSPC) from TeliaSonera to the Swedish National Post and Telecom Agency - PTS.

The NSPC is used as OPC or DPC in the routing label (SIF field in the MSU) together with the NI (SIO field in the MSU) to route a signalling message between different signalling points.

This Application Guide describes the rules and procedures to be used by national operators for the assignment of NSPC (in the signalling network with NI=3).

Background

From the beginning (in the early 1990 decade when other national operators arrived) a disposition of the NSPC plan was made by Televerket/Telia. The disposition of the NSPC was made in 32 512-groups (a total of 16 384). Telia's fixed telephone network (PSTN) was assigned the 512-group number 31 and other operators (including national mobile operators) were assigned each a 512-group starting from the lowest number. Televerket Radio, Tele2 AB, Comviq GSM AB and Nordic Tel were each assigned a 512-group. When the number of new operators grow fast and the need for NSPC from each operator is limited it was not possible to assign each operator an own 512-group. There were no technical or other forced requirements for assigning each operator an own 512-group. The rules used now by TeliaSonera for the assignment of NSPC are:

- 512-group number 31 (see chapter 5) is assigned to TeliaSonera Sverige AB PSTN. TeliaSonera Mobile Networks AB (512-group 4), Tele2 Sverige AB (Tele2 keeps two 512-groups, number 0 and 12, because of the merge with Comviq GSM AB) and Vodafone Sverige AB (512-group 8) keep their assigned 512-groups. If lack of numbers exists the PTS must withdraw NSPC (which are not used) in these 512-groups and the other operators will then be assigned these NSPC. No other operators have been assigned NSPC within the previously assigned 512-groups. Today there is no lack of NSPC.
- Other operators will first be assigned NSPC in the remaining (not assigned) 512-groups.
- NSPC in 5-groups (The assignment of NSPC is made for each signalling point but at the same time a multiple of 5 NSPC is reserved for the operator. The reason is that it makes it easier to manage the assigned NSPC per operator.)
- A goal has been to specify the used NSPCs in the NSPC plan [2].¹

Generally TeliaSonera have had two main design formats of signalling interconnection are implemented.

The signalling interconnection between TeliaSonera's fixed signalling network and other national operator's fixed signalling networks is described in figure 1.

The signalling interconnection between TeliaSonera's fixed signalling network and other national operator's mobile signalling networks is described in figure 2.

¹ Some of the used NSPCs in the plan are being used only for internal matters inside one operators network (if possible, signalling network with NI=2 shall be used for these purposes instead of signalling network with NI=3). In fact there are no such rules set up from Televerket/Telia in the earlier stage of assignment of NSPC, so operator with an group of NSPC have had the possibility to use NSPC for internal purpose.

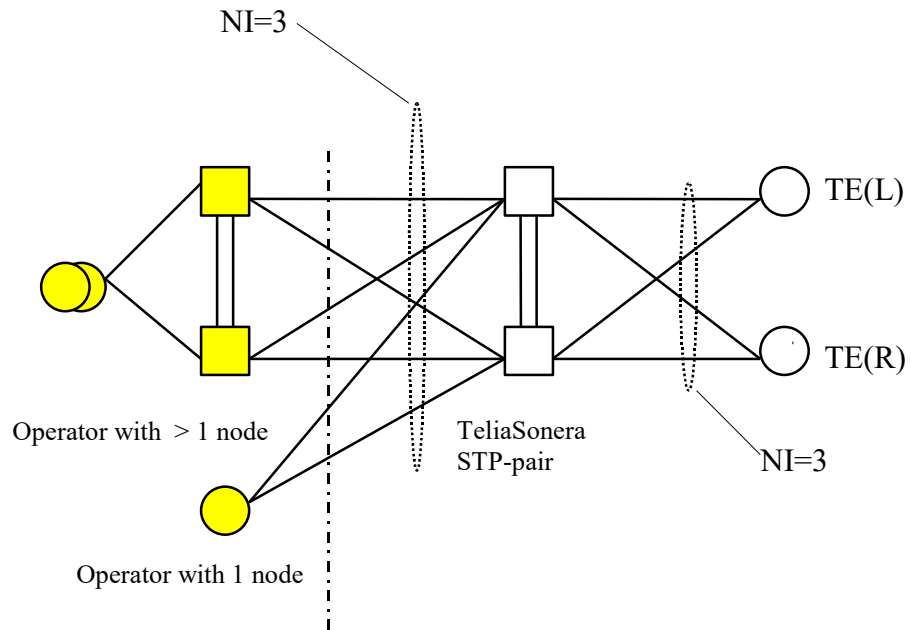


Figure 1 Signalling connections between TeliaSonera signalling network and national fixed operators' signalling networks.

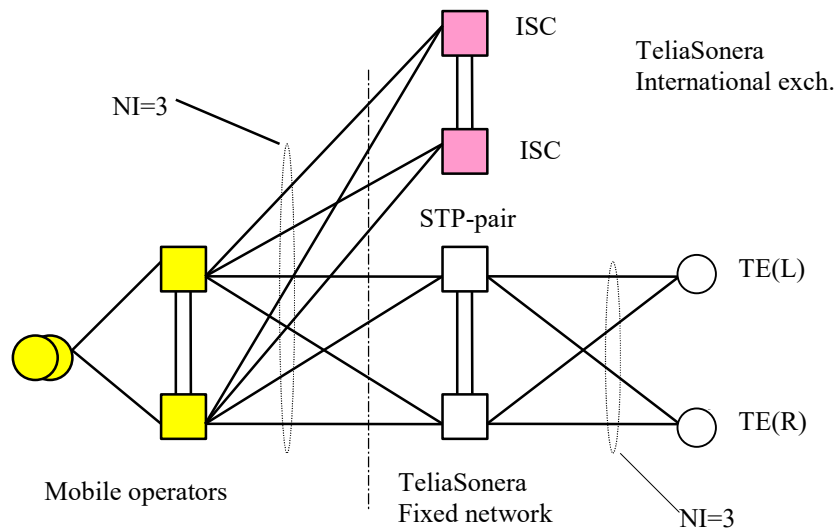


Figure 2 Signalling connections between TeliaSonera signalling network and national mobile operators' signalling networks.

1 Scope

National operators must be able to apply for and maintain NSPC for the purpose to connect their national signalling network to other national public electronic communications networks.

This Application Guide is produced in order to establish a procedure for the assignment of NSPC used between national public electronic communications networks.

This Application Guide:

- Is applicable for all national operators (both fixed and mobile) in Sweden.

- Is applicable for NSPC
- Is applicable for the assignment of NSPC
- Is applicable for the withdrawal of NSPC
- This guide only covers procedures and principles for NSPC (NI=3)
- Principles and procedures for ISPC (NI=0) are described in ITU-T Rec. Q.708 [1]
- Principles and procedures for signalling point codes with NI=2 in the signalling network are handled by the operators themselves.
- Principles and procedures for signalling point codes with NI=1, if ever allocated, will be described in ITU-T Rec. Q.708.

2 Informative references

The following informative 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 informative documents indicated below. For undated references, the latest edition of the informative document referred to apply.

- | | |
|--|--|
| [1] ITU-T Rec. Q.708
(03/99) | Assignment procedures for international signalling point codes |
| [2] TeliaSonera/Skanova document 102/195 83-A101 | Signalpunktsnummerplan NI=3, TeliaSonera's plan of NSPCs available on Post & Telestyrelsen web page
http://www.pts.se/Archive/Documents/SE/SignalPT/SNI3.pdf |
| [3] SS 63 63 93 | PSTN-ISDN-PLMN ISUP Signalling interface for Sweden |

3 Terms and definitions

This Application Guide defines the following terms:

- 3.1 signalling point:** A node in a signalling network that originates and receives signalling messages, and/or transfers signalling messages from one signalling link to another.
- 3.2 signalling relation:** An association between two signalling points that allows interexchange of Signalling System No. 7 messages.
- 3.3 signalling point code:** A code used to identify a signalling point and processed within the Message Transfer Part (MTP) of each signalling point and within users of the MTP.
- 3.4 national signalling point code (NSPC):** A signalling point code with a unique 14-bit format used at the national level for signalling message routing and identification of signalling points involved. The NSPC is used in signalling messages containing the Network Indicator NI=3.
- 3.5 signalling point operator**
a signalling point operator is an operator who is responsible for a signalling point.

4 Symbols and abbreviations

SS7	ITU-T Common Channel Signalling System No 7
DPC	Destination Point Code
ISC	International Switching Centre
ISPC	International Signalling Point Code (used together with NI=0)
LE	Local Exchange
MSU	Message Signal Unit
NI	Network Indicator (included in the SIO field in the MSU)
NSPC	National Signalling Point Code (is used together with NI=3 in this guide)
OPC	Originating Point Code
PTS	Post & Telestyrelsen (National Post and Telecom Agency, the national regulatory authority for the electronic communications sector) http://www.pts.se/
SEP	Signalling End Point
SIF	Signalling Information Field
SIO	Service Information Octet
STP	Signalling Transfer Point
TE	Transit Exchange (L=Left, R=Right)

5 Format of NSPC

The format of the 14-bit binary code used for the identification of national signalling point codes is illustrated in Figure 3. The binary code is represented by two parts: the first part indicating the five (5) most significant bits (NMLKJ), with a decimal range of 0 to 31 and the second part indicating the following nine (9) bits (I-A), with a decimal range of 0 to 511.

N	M	L	K	J	I	H	G	F	E	D	C	B	A
5 bits, number of 512-group					9 bits, 512-group								
National signalling point code (NSPC)													

Figure 3 Format of NSPC

The two parts within the format of the NSPC have only an administrative use and are not used by the protocol or signalling functions.

The decimal value range of the NSPC may be calculated by the following formula:

$$\text{NSPC-range} = \{n \cdot 512 - (n \cdot 512 + 511)\} \text{ where } n \text{ belongs to the range } \{0 - 31\}$$

This means that the NSPC value range in the first (n=0) 512 group is between 0 – 511. The NSPC value range in the 8th 512-group is 4096 – 4607. TeliaSonera has 512-group 31 which means an NSPC value range of 15872 – 16383.

An example of presenting an NSPC is 3-2100 where 3 are the NI value and 2100 is the NSPC value. The NSPC belongs to 512-group 4 in this example.

In the plan for NSPCs the preferred method to represent an NSPC is in a decimal value.

5.1 General principles

5.1.1 The NSPC resource should be managed in such a manner as to ensure adequate capacity to meet the demand for the resource. The need for conservation of the resource is not a reason in itself to deny an application for the assignment of the resource.

5.1.2 NSPC resources should be efficiently utilized and managed.

5.1.3 NSPC resources are to be assigned with fairness and equity.

5.1.4 Assignment confers use of the NSPC resource but does not imply ownership by the signalling point operator.

5.1.5 Signalling point codes for the national level and the international level are assigned separately. The assignment of an NSPC in a national network does not automatically entitle the code holder to an ISPC.

6 Application and Assignment procedure

In the application of NSPC the following information must be included:

- Name, address and organisation number (according to Bolagsverket)
- Contact person in Sweden for the operator (name, telephone number, fax and email address)
- Specification of electronic communication network and service
- Unique name of the signalling point and location of the exchange for which the NSPC is to be implemented

The assignment of NSPC will be based on:

- Only for specified signalling points
- Allowed time interval when the NSPC may be used

When the signalling point operator has been assigned an NSPC the NSPC plan [2] is updated with the new information.

More detailed information regarding the procedures is described in procedures and regulations issued by PTS.

7 Criteria for the assignment of an NSPC

The criteria listed below are provided as a guideline to assist PTS in assigning and administering assignments for an NSPC.

7.1 The signalling point operator² is to apply in writing to PTS.

7.2 The signalling point operator is to certify conformance to the appropriate laws and the regulations issued by PTS.

7.3 The signalling point operator has put into service or is about to put into service a signalling point having at least one MTP signalling relation in the national signalling network.

7.4 The signalling point operator is to comply with relevant ITU-T Recommendations as well as relevant national specifications such as SS 63 63 93 [3], if applicable.

7.5 The signalling point operator is to provide PTS with additional information, such as:

² The term "signalling point operator" is used even if an applicant has not yet any signalling point in operation.

- Contact person
- Unique name of the Signalling point
- Nature of use in the network (more than one function may apply):
- Signalling function (LE, TE, SEP, STP etc.)
- Signalling point manufacturer/type;
- Physical address of the signalling point;
- In-service date of the signalling point (month/year);
- Identification of at least one planned MTP signalling relation:
- Name and address of distant signalling point,
- Location of distant signalling point,
- NSPC of distant signalling point, if known.

7.6 The signalling point operator is to confirm that the requested NSPC shall be placed in service within the period defined by PTS (e.g. 6 months starting from the date of the assignment).

8 Signalling point operator responsibilities

A number of responsibilities issued by PTS are listed below.

- 8.1** The signalling point operator should inform PTS of any change of information that was requested by PTS
- 8.2** The signalling point operator should inform PTS about any changes such as its name, its registered office, the name of its contact person or the location where the signalling point is in operation, etc.
- 8.3** NSPC assigned to the signalling point operator may be allowed to be handover, after approval from PTS, to other operators or signalling point operators.
- 8.4** NSPC assigned to the signalling point operator may not be sold or traded to other operators, signalling point operators or other part.