BHUTAN INFOCOMM AND MEDIA AUTHORITY

ROYAL GOVERNMENT OF BHUTAN

THIMPHU, BHUTAN

Guidelines on Signalling Point Code Numbering Plan in Bhutan

August 2020

FOREWORD

In accordance with the Information , Communications and Media Act of Bhutan 2018 the "***Guidelines on Signalling Point Code Numbering Plan in Bhutan***" is hereby adopted as of 4th August, 2020.

(Chairperson)

BHUTAN INFOCOMM AND MEDIA AUTHORITY

Content

1. Introduction

Signalling is the interchange of information among various Nodes of the Telecommunication Network for the purpose of establishing and controlling the connections. Signalling is also used for providing network-wide services and management capabilities.

Signalling can be considered as the "Nervous System" of the Telecommunication Network. Any Signalling Network needs its own unique address and these unique addresses used to address the Signalling Points in the Signalling Network are called Signalling Point Code (SPC). The SPC are assigned based on the ITU-T Signalling System No 7 (SS7).

There are two types of SPC viz: International Signalling Point Code (ISPC) and National Signalling Point Code (NSPC). The ISPC are described by the ITU in the ITU-T Recommendation Q.708 and whereas the NSPC is described in ITU-T Recommendation Q.704.

The ISPC are mainly required by the Telecommunication network operators in order to establish the SS7 link with the other international telecom network for international intermediate signalling network.

2. Objective

It is the responsibility of the Bhutan InfoComm and Media Authority (Authority) to manage all the spectrum and telecommunication resources in Bhutan. Since, the SPC is also the national resource, it has to be managed efficiently to realise its best use.

This Guidelines is aimed at ensuring fair, transparent and efficient management of the SPC and to provide effective coordination among the operators in enabling the inter- working between the networks in the country as well as with international networks.

3. Legal Basis

The Guidelines on Signalling Point Code Numbering Plan in Bhutan is issued by the Authority in accordance with the Section 58 of the Bhutan Informations, Communications and Media Act 2018.

4. Amendments

This Guideline is subject to the amendment and changes when required. Such amendment and changes shall be made in accordance with the needs and changes in technical requirements, national priorities, Government policies and industry trends. Amendment of this Guideline by way of addition, variation or repeal may be affected by the Authority.

5. Definitions

In addition to the following terms, or unless the context requires otherwise, the words and terms used in this Guidelines shall have the same meaning as assigned in the Act.

Signalling Point: A node in a signalling network that originates and receives signalling messages, or transfers signalling messages from one signalling link to another, or both.

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.

International Signalling Point Code: A signalling point code with a unique 14-bit format used at the international level for signalling message routing and identification of signalling points involved.

National Signalling Point Code: A signalling point code with a unique 14-bit format used at national level to establish direct SS7 signalling links and interconnection with local networks.

Signalling links: Signalling links are basic components in a signalling network connecting together signalling points. The signalling links encompass the level two functions, which provide for message error control (detection and subsequent correction).

Telecommunication: Telecommunication means any transmission, emission or reception of signs, signals, writing, images, data and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic system;

6. Abbreviations

SS7	Signalling System No 7
ISPC	International Signalling Point Code
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector

MTP	Message Transfer Part
NI	Network Indicator
NSPC	National Signaling Point Code
NID	Network Identification
SANC	Signalling Area/Network Code
SP	Signalling Point
SPC	Signalling Point Code

7. Structure of International Signalling Point Code (ISPC)

ITU-T has specified in the Recommendation Q.708 the following 14-bit binary format for the identification of the ISPC to be used in the international SS7 Signaling links as shown in Table below:

<table>
<tr><td>NML</td><td>KJIHGFED</td><td>CBA</td></tr>
<tr><td>Zone identification (3 bits)</td><td>Area / network identification (8 bits)</td><td>Signalling point identification (3 bits)</td></tr>
<tr><td colspan="2">Signalling area / network code (SANC)</td><td></td></tr>
<tr><td colspan="3">International Signalling Point Code (3-8-3)</td></tr>
</table>

The 3-bit sub-field 'NML' defines the world geographical zone where the network is located. The 3 binary bits of Geographical area (Zone ID) has 0 to 7 decimal values. Each country is classified and assigned the number based on the region. The ITU zone ID for Bhutan is classified under the region Middle East Asia which is assigned with decimal number "4".

The 8-bit sub-field 'KJIHGFED' identifies the geographical area or network within a specific world zone. The 8 binary bits of network identification has 0 to 255 decimal values.

The 3-bit sub-field 'CBA' identifies the Signaling point (international exchange) within a specific geographical area or network. The 3 binary bits of Signalling point identification has 0 to 7 decimal values.

The combination of sub-fields 'NML-KJIHGFED' is defined as a Signaling Area / Network Code (SANC). And each country will be assigned at least one SANC code by the ITU-T.

The allocation of the codes in the first sub-field 'CBA' in this 3-8-3 bit structure is left for the national authorities with the responsibility to notify the ITU-T Secretariat on the codes used.

The 3-bit structure of the 'CBA' sub-field allows 8 ISPC to be used for each SANC code. Should more than 8 International Signaling Points be required, one or more additional SANC code(s) would then be assigned by ITU-T for the country.

Prior to the approval of this Guideline, the following ISPC were already being used by the two Mobile operators:

- 4-072-1
- 4-072-2
- 4-072-3
- 4-072-4
- 4-072-5

8. Structure of National Signalling Point Code (NSPC)

The NSPC assignment depends on the format designed by each country. The NSPC also consists of 14 binary bit codes, hence have the total number of 2^14 decimal numbers = 16384 NSPC.

The NSPC are the numbers that uniquely identify a network in a SS7 network.

For the NSPC structure in Bhutan, the 14 bits of NSPC are first converted to a five-digit decimal number denoted 'ABCDE'. That will range from 00000 to 16383. The NSPC 'ABCDE' decimal numbers are then divided into two fields. The first field consists of three decimal digits 'ABC' representing the Network Identity. The network identity has 164 blocks, 163 of which has the capacity of 100 codes and one (#164) with a capacity of 83 codes.

The second field consists of two decimal digits 'DE' representing the signalling point code. Each block of 'DE' will have a capacity of 100 signalling point codes.

The structure of NSPC for Bhutan is as shown in the table below:

Network Identity	**Signalling Point Code**
ABC (3 decimal digits)	DE (2 decimal digits)
000 to 163	00 to 99 for all ABC values Except for ABC = 163, the value of DE is 00 to 83

9. Eligibility Criteria for the Assignment of ISPC and NSPC

Only the company/organization satisfying the following are eligible to apply for the assignment of ISPC and NSPC in Bhutan:

(i) If it is a Mobile operator,

(ii) Intending to operate, or has already set up and operates, a public telecommunications network or a telecommunications system with a switching or switching-supporting function, and

(iii) Intending to maintain signalling relations with other eligible parties in the intermediate signalling network,

(iv) Intending to establish SS No 7 signalling relations.

10. Assignment Procedure of ISPC and NSPC

(i) ISPC

The eligible firms according to the section 9 of these Guidelines shall apply in writing to the Authority for allocation of ISPC.

If the Signalling Point Identification number is available for a particular SANC code, the Authority shall assign the available ISPC to the applicant,

If the Signalling Point Identification number for the particular SANC code is all used, the Authority then shall request ITU-T for an additional SANC code and assign the corresponding Signalling Point Identification number to the applicant.

(ii) NSPC

The eligible firms as according to the section 9 of this Guidelines shall be allocated with certain blocks of Network Identity number which is from 000 to 163 and the firms shall choose their own two digit decimal number Signalling Point Code.

However, the SPC number should be chosen sequentially as much as possible by the applicant.

11. Responsibilities of the Operators Assigned with ISPC and NSPC

The operators shall be responsible to maintain the updated database of the ISPC and NSPC codes used.

The operators shall update the ISPC and NSPC codes in use to the Authority once every six months.