



Consultation Paper on Refarming of Spectrum in Different Cellular Mobile Bands

Nepal Telecommunications Authority

Contents

1. Overview	3
2. Objective	3
3. Correspondence	3
4. Radio Frequency Spectrum	4
5. Present Status of Various Bands	4
5.1. CDMA-800 MHz Band	4
5.2. MF-TDMA Band	5
5.3. GSM-900 MHz Band	5
5.4. GSM-1800 MHz Band	5
5.5. CDMA-1900 MHz Band	6
5.6. IMT-2000 Band	6
6. Re-alignment Plan	6
6.1. CDMA-800 MHz Band	6
6.2. GSM-900 MHz Band	7
6.3. GSM-1800 MHz Band	7
6.4. IMT-2000 MHz Band	8
7. Consultation	8

Consultation on Refarming of Spectrum in Different Cellular Mobile Bands

1. **Overview:** In Nepal there are three nationwide Basic Telecommunications Service Providers. The Incumbent Operator, Nepal Doorsanchar Co. Ltd., is allowed to provide services using wireline and wireless technologies. The second operator, United Telecom Ltd., is allowed to provide services through Wireless in Local Loop (WLL) system and the operator opted to use CDMA technology. The third operator, Nepal Satellite Telecom Pvt. Ltd., which has not started its service, is allowed to provide services using both wireline and wireless technologies. Apart from that, there are two Cellular Mobile operators. The Incumbent operator is providing its services through GSM and CDMA technologies and the second mobile operator, Spice Nepal Pvt. Ltd., is providing its services using GSM technology. Further there are one operator providing Limited Mobility service and two Rural Telecommunications service providers. The rural operators, STM Telecom Sanchar Pvt. Ltd. and Smart Telecom Pvt. Ltd., are allowed to use any technology to provide services.

As of 15th July 2008, there are around 532,000 PSTN subscribers, 3.5 million mobile subscribers and around 300,000 WLL subscribers in Nepal.

In the recent past, the Authority has received written requests for frequencies in different cellular mobile bands. Among them, the most requested bands are CDMA-800 MHz and GSM-900 MHz bands, as these bands are most suitable for the deployment of low cost technology solution to expand their networks in rural areas also.

A study initiated by the Authority has identified that the present uneven assignment of the frequencies to the operators is inefficient and has been a barrier to some operators to introduce low cost technologies and expand their network. Therefore, the Authority decided to explore the possibility of re-farming of frequencies in different cellular mobile bands in order to create an environment conducive to a more level playing field and to allow the use of low cost technologies.

2. **Objective:** In the above context, the Authority through this Consultation Paper, seeks the views of the stakeholders on the re-farming of spectrum in different cellular mobile bands to facilitate the introduction of low cost technologies by the fixed and mobile operators in Nepal.
3. **Correspondence:** Any correspondence regarding this Consultation Paper shall be forwarded to the following address:

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All comments/suggestions received regarding this Consultation Paper will be published in NTA's web site (www.nta.gov.np). If your comments/suggestions or part of it are to be treated as confidential, you are requested to indicate it clearly and mark them accordingly.

4. **Radio Frequency Spectrum:** The radio frequency spectrum is a limited natural resource, as asset which should be used in the most efficient way for the benefit of the people. Since frequencies are scarce and demand for some of the bands is on the rise, the assignment of frequencies to the individual operators needs to be done carefully and with a long term vision to use it efficiently.

In Nepal, for the public telecommunications services, the Government of Nepal has authorized Nepal Telecommunications Authority to assign and manage the frequencies. The frequency allotment for the different telecommunications services is done by the Radio Frequency Policy Determination Committee, headed by the Minister or State Minister for Ministry of Information and Communications.

As number of public telephony services utilizing radio frequency is growing rapidly, spectrum assignment must be done with long term vision to ensure efficient and effective utilization of the resources. In this regard, spectrum assignments need revision from time to time so as to fulfill the present and future requirements.

5. Present Status of Various Bands

5.1 CDMA-800 MHz Band (824-840 MHz paired with 869-885 MHz)

- a. A bandwidth of 2X2.5 MHz (824-826.5 MHz paired with 869-871.5 MHz) of spectrum is assigned to M/S United Telecom Ltd. for the operation of Basic Telephone and Limited Mobility Services.
- b. A bandwidth of 2X8 MHz (827-835 MHz paired with 872-880 MHz) of spectrum is assigned to M/S Nepal Doorsanchar Co. Ltd. for the operation of Basic Telephone and Cellular Mobile Services.

- c. A bandwidth of 2X5 MHz (835-840 MHz paired with 880-885 MHz) of spectrum is assigned to M/S Nepal Satellite Telecom Pvt. Ltd. for the operation of Basic Telephone Service.

5.2 MF-TDMA Band (887.6-890 MHz paired with 932.6-935 MHz)

- a. A bandwidth of 2X2.4 MHz (887.6-890 MHz paired with 932.6-935 MHz) of spectrum is assigned to M/S STM Telecom Sanchar Pvt. Ltd. for the operation of Rural Telecommunications Service.

5.3 GSM-900 MHz Band (890-915 MHz paired with 935-960 MHz)

- a. A bandwidth of 2X7.2 MHz (890-897.2 MHz paired with 935-942.2 MHz) of spectrum is assigned to M/S Nepal Doorsanchar Co. Ltd. for the operation of Cellular Mobile service and an additional bandwidth of 2X4.8 MHz (897.2-902 MHz paired with 942.2-947 MHz) of spectrum is assigned on a temporary basis.
- b. A bandwidth of 2X6 MHz (902.6-908.6 MHz paired with 947.6-953.6 MHz) of spectrum is assigned to M/S Spice Nepal Pvt. Ltd. for the operation of Cellular Mobile service and an additional bandwidth of 2X2 MHz (908.6-910.6 MHz paired with 953.6-955.6 MHz) is assigned on a temporary basis.
- c. A bandwidth of 2X4.4 MHz (910.6-915 MHz paired with 955.6-960 MHz) of spectrum is assigned to M/S Nepal Satellite Telecom Pvt. Ltd. for the operation of Basic Telecommunications service.

5.4 GSM-1800 Band (1710-1755 MHz paired with 1805-1850 MHz)

- a. A bandwidth of 2X9 MHz (1710-1719 MHz paired with 1805-1814 MHz) of spectrum is assigned to M/S Nepal Doorsanchar Co. Ltd. for the operation of Cellular Mobile service and an additional bandwidth of 2X6 MHz (1719-1725 MHz paired with 1814-1820 MHz) is assigned on a temporary basis.
- b. A bandwidth of 2X9 MHz (1732-1741 MHz paired with 1827-1836 MHz) of spectrum is assigned to M/S Spice Nepal Pvt. Ltd. for the operation of Cellular Mobile service and an additional bandwidth of 2X2 MHz (1741-1743 MHz paired with 1836-1838 MHz) of spectrum is assigned on a temporary basis.
- c. A bandwidth of 2X9 MHz (1744-1753 MHz paired with 1839-1848 MHz) of spectrum is assigned to M/S Nepal Satellite Telecom Pvt. Ltd. for the operation of Basic Telecommunications service.

5.5 CDMA-1900 MHz (1850-1880 MHz paired with 1930-1960 MHz)

- a. A bandwidth of 2X10 MHz (1850-1860 MHz paired with 1930-1940 MHz) of spectrum is assigned to M/S United Telecom Ltd. for the operation of Basic Telephone service.

5.6 IMT-2000 Band (1960-1980 MHz paired with 2150-2170 MHz)

- a. A bandwidth of 2X10 MHz (1960-1970 MHz paired with 2150-2160 MHz) of spectrum is assigned to M/S Spice Nepal Pvt. Ltd. for the operation of W-CDMA based 3G service.
- b. A bandwidth of 2X10 MHz (1970-1980 MHz paired with 2160-2170 MHz) of spectrum is assigned to M/S Nepal Doorsanchar Co. Ltd. for the operation of W-CDMA based 3G service.

6. Re-alignment Plan

6.1 CDMA-800 MHz band

- a. A frequency band of 2X16.5 MHz (824-840.5 MHz paired with 869-885.5 MHz) will be exclusively allocated for CDMA.
- b. A frequency band of 2X16.5 MHz will be distributed amongst the operators in the following manner:

Operators	Ch. No.	Spot Frequency (Tx)	Bandwidth
Operator 1	1	870.030	2X5 MHz including Guard Band
	42	871.260	
	83	872.490	
	124	873.720	
Guard Band		600 KHz	
Operator 2	185	875.55	2X6.5 MHz including Guard Band
	226	876.78	
	267	878.01	
	308	879.24	
	349	880.47	
Guard Band		600 KHz	
Operator 3	370	881.1	2X5 MHz including Guard Band
	411	882.33	
	452	883.56	
	493	884.79	

6.2 GSM-900 MHz band

- a. A frequency band of 2X27.4 MHz (887.6-915 MHz paired with 932.6-960 MHz) will be exclusively allocated for GSM.
- b. Nepal Doorsanchar Co. Ltd. shall confine its operation within the permanently assigned bandwidth of 2X7.2 MHz (890-897.2 MHz paired with 935-942.2 MHz). The temporarily assigned bandwidth of 2X4.8 MHz of spectrum will be revoked.
- c. The bandwidth assigned to M/S Spice Nepal Pvt. Ltd. will be moved upwards by 0.6 MHz and M/S Spice Nepal Pvt. Ltd. will be reassigned a bandwidth of 2X6 MHz (903.2-909.2 MHz paired with 948.2-954.2 MHz). The temporarily assigned bandwidth of 2X2 MHz of spectrum will be revoked.
- d. The bandwidth of 2X2.4 MHz (887.6-890 paired with 932.6-935 MHz) will be assigned to M/S STM Telecom Sanchar Pvt. Ltd. for MF-TDMA operation.
- e. The assignment of bandwidth of 2X4.4 MHz (910.6-915 MHz paired with 955.6-960 MHz) of spectrum to M/S Nepal Satellite Telecom Pvt. Ltd. will remain unaltered.

6.3 GSM-1800 MHz band

- a. Due to the allocation of 30 MHz (1850-1880 MHz) of bandwidth to CDMA, the standard GSM-1800 MHz band has been decreased from 2X75 MHz to 2X45 MHz. Thus, it is planned that CDMA will be phased out in this band within a couple of years to recover full 2X75 MHz of spectrum for GSM. In the first phase, the assignment of 2X10 MHz of spectrum to M/S United Telecom Ltd. will be reduced to 2X5 MHz of spectrum in lieu of 2X5 MHz of spectrum in CDMA-800 MHz band. After a time frame agreed upon with United Telecom Pvt. Ltd., CDMA operation will be phased out from this band.
- b. M/S Nepal Doorsanchar Co. Ltd. will confine its operation from currently assigned 2X15 MHz (9 MHz permanently and 6 MHz temporary) of spectrum to 2X12 MHz (1710-1722 MHz paired with 1805-1817 MHz).
- c. M/S Spice Nepal Pvt. Ltd. will be assigned 2X12 MHz (1732-1744 MHz paired with 1827-1839 MHz) of spectrum.

- d. The assignment of spectrum to M/S Nepal Satellite Telecom Pvt. Ltd. (1744-1753 MHz paired with 1839-1848 MHz) will remain unaltered.

6.4 IMT-2000 MHz Band

- a. Current allocation of FDD bandwidth will be increased from 2X20 MHz to 2X30 MHz (1950-1980 MHz paired with 2140-2170 MHz).
- b. The spectrum band of 1900-1920 MHz (20 MHz) and 2010-2025 MHz (15 MHz) will be allocated for TDD.
- c. Current assignment of spectrum to M/S Spice Nepal Pvt. Ltd. (1960-1970 MHz paired with 2150-2160 MHz) and M/S Nepal Doorsanchar Co. Ltd. (1970-1980 MHz paired with 2160-2170 MHz) will remain unaltered.

7. Consultation:

Comments/suggestions are invited on:

- Spectrum re-farming plan proposed in Section 6 above.
- Any other matters related to this Consultation Paper.