



# Nepal East West Optical Fiber SDH Project

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## Project Background of Phase I

Nepal East West SDH (NEWS) Project is part of 7th Telecom Development Project of Nepal Telecom to provide Optical Fiber Backbone Telecom Information Superhighway along the East West Highway from Bhadrapur in the East and Lamahi in the west and from Kohalpur to Nepalgunj. This project serves all the major towns like, Kathmandu, Biratnagar, Birganj, Bharatpur, Bhairahawa, Butwal and Nepalgunj.

The project cost is divided as Nepali rupees 134 crores funded by the Government of India and around Nepali rupees 40 crores funded by Nepal Telecom. Government of India has appointed Telecommunications Consultant India Limited (TCIL) as the executing agency for the project. The project is implemented on Turn-Key basis. The procurement, delivery, installation, commissioning of SDH transmission equipment, Optical fibre cable, Ducts & GI Pipes are carried by TCIL. "Ready for Installation" of the all the 79 stations works are carried by Nepal Telecom. The optical fibre cable between Kathmandu to Hetauda has been linked through OPGW (Optical Power Ground Wire) which has been leased from Nepal Electricity Authority.

898 km 24F armoured single mode optical fibre cable has been laid. These cables are incased in HDPE lubricated ducts of 40/33 mm dia laid underground. Two additional ducts of similar nature are laid along the main duct to meet the future requirement of Nepal Telecom. This way a total number of three ducts are laid, one for housing of OFC and two extra shall be for future use.

The phase I covers 79 exchanges. The project period was 20 months which started from 18<sup>th</sup> Dec 2002 and completed on 17<sup>th</sup> Aug 2004.

At present, all the outside plant (OSP) and SDH equipment installation works have been completed. All major links namely Nepalgunj-Kohalpur, Bhairahawa-Butwal, Butwal-Bardghat-Kawasoti-

Bharatpur-Tadi-Hetauda, Patan-Hetauda, Hetauda-Birgunj-Nijgadh-Lalbandi-Janakpur, Lalbandi-Chauharwa-Vardaha-Itahari, Itahari-Biratnagar, Itahari-Damak-Bhadrapur are commissioned.

The following equipment has been installed at 79 stations:

STM-16 (30240 channel capacity) at 6 stations

STM-4 (7560 channel capacity) at 19 stations

STM-1 (1890 channel capacity) at 54 stations

The following OFC works has been completed and tested:

- (i) Trenching – 708kms
- (ii) 3 way ducting – 730kms
- (iii) Sub ducting – 95kms
- (iv) OFC cable blowing – 904kms
- (v) Splicing – 351Nos.
- (vi) Bridge crossing – 262Nos.

Similarly Network Management System (NMS) has been installed at Patan from where all the Network Elements can be controlled for Fault Management, Configuration Management, Performance Management and Security Management. The network element data are processed by the Telecommunication NMS (TNMS) Netserver, which acts as a mediation device for the Data Communication Network (DCN) between the network elements and the TNMS core Server. The TNMS Core Client contains the Graphical User Interface (GUI) for the network management. All above mentioned management services of the TNMS Core Server are accessible through the Client Server.

The provisional acceptance test (PAT) has been conducted jointly by NT and TCIL in respect of SDH equipment installation, OFC links and OFC works. The PAT has been completed on 12.09.2004. The net-



work integration has been completed and NMS located at Patan with routers at Tandhi and Itahari is fully operational. The network has been synchronized with primary reference clock (PRC) at Patan and SSU (synchronization supply unit) at Butwal and Itahari. Three stations out of 79 stations namely Nepalgunj, Karkando and Kohalpur could not be monitored through NMS at Patan.

**Project Background of Phase II**

A proposal for Phase II has already been submitted to Government of India. The estimated BOQ is being worked out and shall be finalized with a minor amendment to the proposal. The amendments shall include IP backbone network and five additional cross-boarder links to India.

The Phase II proposes to connect remaining portion of East West Highway like (1) Lamahi-Kohalpur-Attaria-Mahendranagar (2) Birtamod-Kakarbhitta (3) Butwal-Kaligandaki- Pokhara-Damauli-Kathmandu (OPGW link) as the main route and also include some important spur routes.

The Phase II shall cover 55 stations for SDH equipment and 950 km of OFC route. HMG Nepal has requested Government of India for favorable consideration for Phase II.

**Benefits of the Project**

The phase I of project has been completed on time. It has created modern and reliable transmission network. It will create the infrastructure for Information Super Highway to integrate most of the major & rural exchanges along the national East West Highway. It is planned to fulfill traffic demand of the nation up to 2007.

This will provide sufficient bandwidth & develop the networks for ISP's, Banks, TV/Video and other value added service providers. Enough capacity of long distance circuits could be provided. Ultimately, it will strengthen Nepal Telecom's backbone transmission network. Economic activity in the region will increase with implementation of this project as telecommunication is one of most important development infrastructure. It will help in poverty reduction.

The huge bandwidth available through this network can be gainfully employed for a number of purposes. These include

- \* TV and Radio broadcast transmission links for

real time national and international broadcasts of programmes originating in studios in Kathmandu and other cities in Nepal.

- \* Information Technology Park.
- \* IT Enabled services e.g. Call Centers, Medical transcription centers, Business process outsourcing etc.
- \* Setting up an IP Core network for introduction of broadband and multimedia application services- with domestic content achievable by linking top educational and healthcare institutes in the world through E-education/E-health networks.
- \* E-governance and
- \* Many other services.

**Followings are the direct benefits of this project:**

- \* Nepal Telecom has reduced the national distant trunk tariff as well as international call tariff for SAARC countries effective from 1<sup>st</sup> October, 2004 as follows

**a) National Distant Trunk Tariff**

Time	From 8:00 AM to 6:00 PM		From 6:00 PM to 10:00 PM & From 6:00 AM to 8:00 PM		From 10:00 PM to 6:00 AM	
Distance km	Tariff (per min)	Reduction in tariff	Tariff (per min)	Reduction in tariff	Tariff (per min)	Reduction in tariff
0-50	NRs 2.5	No reduction	NRs 1.7	No reduction	NRs 1.0	No reduction
50-200	NRs 5.25	No reduction	NRs 3.52	No reduction	NRs 2.10	No reduction
Above 200	NRs 6.5	28 %	NRs 5.0	17%	NRs 3.0	17%

**b) International Call Tariff for SAARC countries**

Time	From 6:00 AM to 8:00 PM		From 8:00 PM to 6:00 AM	
Countries	Tariff (per min.)	Reduction in tariff	Tariff (per min)	Reduction in tariff
India	NRs 25	17%	NRs 15	No reduction
SAARC countries except India	NRs 25	45 %	NRs 20	12%

- \* A committee is already being formed to finalize the tariff for E1 circuit to be leased to other telecom service providers, FM radio operators and other users. The objective is to make this tariff comparable with SAARC countries, if not lowest in the region. This will be major



benefit of the project for the ICT(Information & Communication Technology) development in the country.

\* Presently the international trunk traffic of Nepal telecom is carried by 'Sagarmatha Earth Station' and terrestrial microwave links with India and Bangladesh. There exists 14 E1(i.e.420 circuits) to India on microwave terrestrial link and 25 circuits to Bombay via Satellite plus 1005 circuits to other part of the world via Satellite. Nepal Telecom is exploring the possibility of utilizing optical fibre cable link to India to enter other countries through existing international submarine cables. Nepal Telecom has started discussions with different operators like BSNL, VSNL and

Bharti Telecom in this regard. This will not only help to reduce international long distance tariff but also to increase international circuit capacity. It will greatly enhance the quality of circuits for voice as well as data

**Future Vision**

**Asia Information Super Highway**

The completion of around 1200 km optical fiber cable laying along East West Highway can become a part of Asia Information Superhighway that will connect many more countries along Asian Highway as it is proposed by many countries. An information Super Highway may be constructed leading to cheaper, reliable and alternate communication to satellite. This can lead a way to cheaper communication channel within Asian countries.

**Combined Map of Nepal with Phase I & II**

