

**MINISTRY OF COMMUNICATIONS AND
INFORMATION TECHNOLOGY**

CHAPTER II

Bharat Sanchar Nigam Limited

Functioning of Telecom maintenance regions

Executive Summary

With a turnover of more than Rs. 35,812 crore and net profit of Rs. 575 crore for the financial year 2008-09 Bharat Sanchar Nigam Limited is one of the largest telecom service providers in India. The Company maintains a large transmission network comprising optical fiber cables and microwave systems through which 602 districts and 5.6 lakh villages in the country are connected.

Telecom Maintenance Regions of BSNL are the divisions responsible for the maintenance of long distance transmission systems of the Company. The four maintenance regions viz., Eastern, Northern, Southern and Western control more than 19,100 route kilometers of optical fiber cable and microwave systems functioning in the country. With the entry of private service providers into the telecommunication sector all operators essentially require interconnection with BSNL network. Provisioning of Points of Interconnect (POIs) and monitoring the long distance traffic through these POIs for correct realisation of interconnection usage charges is also an important area of activity for the Maintenance Regions.

The major findings of the performance audit are:

- Microwave systems costing Rs. 36.84 crore were either used for a very short period or were not put to use at all rendering the investment unfruitful. This was partly due to commissioning of microwave systems in routes where more stable optical fibre systems were already in operation.
- Delay in commissioning of 'Lawful Interception and Monitoring' systems led to idling of investment of Rs. 5.84 crore besides delay in start of International Private Leased Line services.
- Delay in finalisation of tariffs for use of signaling through Stand Alone Signaling Transfer Point system deprived the BSNL of projected profit of Rs. 329.30 crore per annum.
- Records on receipt and issue of stores received against all 94 purchase orders released during 2004-05 to 2008-09 were not maintained in Eastern Telecom Region.

Summary of recommendations

The Company may:

- (i) **Review and strengthen its planning and execution processes by authorising the Maintenance Regions to conduct mid course review of projects for reducing the long gestation periods of transmission projects.**
- (ii) **Strengthen the control and monitoring mechanism in relation to accounting of stores so as to improve its inventory management.**
- (iii) **Fix tariff and realise charges from private operators for use of CCS-7 signals as stipulated in the Interconnect Usage Charges agreements.**
- (iv) **Initiate urgent action to collect outstanding Interconnect Usage Charges from private operators by invoking relevant provisions of the Interconnect Usage Charges agreements.**

2.1 Introduction

Bharat Sanchar Nigam Limited (BSNL) with a turnover of more than Rs. 35,812 crore and net profit of Rs. 575 crore for the financial year 2008-09 is one of the largest telecom service providers in India. The Company has about 4.6 crore line basic telephone capacity, 0.8 crore Wireless in Local Loop and 5.2 crore Global System of Mobile communications capacity. The Company also maintains a large transmission network comprising optical fibre cables and microwave systems through which 7,330 cities/towns and 5.6 lakh villages in the country are connected.

Transmission systems form the backbone of the telecommunication network. 'Over head wires' used to be the transmission media in India which later gave way to co-axial/copper cables and was followed by Radio frequency based system. With the advent of Optical Fibre Cable (OFC), which works on digital technology, Bharat Sanchar Nigam Limited started using OFC for creating transmission network. Apart from these, BSNL also use Satellite Systems as a transmission medium.

Telecom Maintenance Regions of BSNL are responsible for the maintenance of long distance transmission systems in the country. The Telecom Projects Wing of BSNL, the agency responsible for execution of long distance media, after physical completion and Acceptance Testing (A/T) hands over routes/networks to the Maintenance Regions for utilisation and maintenance. The long distance network maintenance of BSNL is divided into four regions – Eastern Telecom Region (ETR), Northern Telecom Region (NTR), Southern Telecom Region (STR) and Western Telecom Region (WTR). Each Region is headed by a Chief General Manager (CGM). The four Maintenance Regions control more than 19,100 route kilometres of optical fibre cables and microwave systems functioning in the country. During the year 2008-09 the total expenditure on the upkeep and maintenance of the long distance transmission systems was Rs. 393.62 crore. With the entry of private service providers into the telecommunication sector all operators essentially required interconnection with BSNL network. Interconnection facilities for National Long Distance (NLD) and International Long Distance (ILD) to the operators are provided by BSNL at their Level I Trunk Automatic Exchanges (TAXs) through Points of Interconnect (POIs). Provisioning of POIs and monitoring the long distance traffic through these POIs for correct realisation of Interconnection Usage Charges (IUC) is also an important area of activity for the Maintenance Regions.

Geographical coverage of each of the Maintenance Region is as given below in **Table 2.1**:

Table 2.1

Sl. No.	Circle	Location of Head Office	States/Union Territories covered
1	WTR	Mumbai	Maharashtra, Madhya Pradesh, Chhattisgarh, Gujarat, Goa, Diu, Daman and Dadra and Nagar Haveli
2	ETR	Kolkata	Andaman and Nicobar Islands, Assam, Bihar, Jharkhand, Orissa, Sikkim, West Bengal, Arunachal Pradesh, Meghalaya, Mizoram, Tripura, Manipur and Nagaland
3	NTR	Delhi	Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh (East and West) and Uttarakhand
4	STR	Chennai	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Pondicherry

2.2 Organizational Setup

The overall control over the functioning of the Telecom Regions rests with the Chairman and Managing Director (CMD) of BSNL. At the Corporate Office level, the Director (Operations) assists the CMD and at the Telecom Region level, the respective Chief General Managers (CGMs) and their General Managers (GMs) and Deputy General Managers (DGMs) assist the CMD.

2.3 Scope of Audit

Performance audit was conducted during May 2009 to August 2009 with a view to examine the functioning of the Telecom Maintenance Regions of BSNL covering the four regions viz., NTR, ETR, WTR and STR with reference to documents maintained at the Corporate Office and Head offices of the Maintenance Regions along with their selected divisions and sub-divisions (*Annexure I*). The period covered in Performance Audit was from 2004-05 to 2008-09.

2.4 Audit objectives

The main audit objectives were to assess that:

- Requirements for loading transmission systems were planned as per the targets fixed by Corporate office and the demands of territorial circles;
- Projects completed by the Telecom Project wing were taken over in time, utilised optimally and their operation and maintenance were done economically, efficiently and effectively; and
- Leased line circuits, infrastructure and interconnection facilities were provided promptly to other telecom service providers as per their requirement, and the billing and collection of revenue from leased line circuits, Interconnect Usage Charges (IUC), infrastructure sharing charges *etc.*, were done timely.

2.5 Audit criteria

The following audit criteria were used:

- Codal provisions, instructions (of Telecom Regulatory Authority of India and BSNL Corporate office) and transmission media (Media) Guidelines for planning of projects;
- Operation and financial performance indicators and bench marks fixed by the BSNL for the Maintenance Regions;
- Monitoring and internal control mechanisms for taking over of completed projects, their utilisation, maintenance and upkeep, provision of services, billing and collection of revenue; and
- Terms and conditions of interconnect agreements.

2.6 Audit methodology

The Report was prepared based on review of relevant documents (both technical and accounts maintained by the sub-regional/circle offices), discussions with various levels of the Management and field visits with regard to maintenance of long distance media, Level I TAX, provision of Point of Interconnection (POI), IUC and infrastructure sharing charges *etc.* Entry and Exit meetings were also held in May 2009 and December 2009 respectively with the Management.

2.7 Acknowledgement

The co-operation and assistance extended by the Company Management and staff at all levels is acknowledged.

2.8 Audit findings

Telecom Maintenance Regions of BSNL, apart from the upkeep of the transmission networks, are also involved in the assessment of media requirements, monitoring the utilisation of existing media, provision of interconnection facilities to other telecom service providers and billing and collection of IUC charges from NLD and ILD operators. Maintenance Regions are also the custodian of the vast network assets of the Company. Hence, it is important that Maintenance Regions along with their technical efficiency should have a sound financial management system and a robust internal control system. Audit findings on the planning of media, maintenance of assets and collection of revenue from other operators are discussed below:

2.8.1 Long gestation period in completion of routes and systems

The Telecom Maintenance Regions take over transmission systems/routes from the Projects Circle[▼] after Acceptance Testing (A/T) for their utilisation and upkeep. Existing rules/instructions stipulate that areas to be covered under each route/scheme of the project should be identified in the co-ordination meetings held between the Territorial Circles,

[▼] *In the Company, local area network is established and maintained by Secondary Switching Areas (SSAs) under territorial circles whereas long distance media, i.e., transmission systems, mostly involving OFC, are established by the Telecom Project circles (TPCs).*

Maintenance and Project authorities. Departmental instructions stipulated that the views of the Maintenance Heads should be taken into account while finalising the schemes.

It was observed that requirement and planning of routes/systems projected by the Maintenance wings are incorporated in the five year plan and are considered for execution during the annual Regional Trunk Planning and Coordination (RTPC) meetings. But these proposals undergo changes on account of various reasons like delay in procurement of stores, delay in physical completion of works *etc.* In telecommunication sector where technological changes are rapid, long gestation period in the completion of systems and routes would lead to idling of investment due to technological obsolescence and delay in achieving planned objectives. Maintenance Regions, as an agency responsible for the upkeep of transmission network, should play an important role in monitoring the progress of works undertaken by the projects wing and if necessary cause mid course correction in respect of delayed schemes. This would not only ensure use of latest technology in the transmission network but also facilitates timely utilisation of planned schemes. Audit findings in this regard are discussed below.

2.8.1.1 Avoidable investment on microwave systems

Planning for new routes and systems invariably should take into account the capacity of the existing media and their technology. OFC media was inducted into the telecommunication network during the decade of 1990s and was considered as a reliable media compared to the Microwave (M/W) media.

It was observed that two M/W systems commissioned in Manoharpura-Ajmer and Bala and Kheladevgarh routes in Ajmer area under NTR in January/February 2004 at a cost of Rs. 5.11 crore were never loaded because OFC systems were already in existence in these routes. Similarly, in Gwalior-Jhansi, route M/W system was commissioned in November 2004 at a cost of Rs. 1.52 crore when the more stable Optical Fibre system was already in existence in the route since the year 2001.

Likewise it was seen in STR that Microwave Systems worth Rs. 30.21 crore commissioned during the years 2001-02, 2002-03 and 2003-04 were either used for a very short period or not put to use at all rendering the investment unfruitful.

When pointed out, office of the CGM STR replied that commissioning of the microwave systems was delayed because of delay in ensuring infrastructure like site, tower building *etc.* and also due to technological changes, microwave systems became the least choice of media solution. It was also stated that all these systems were planned during the erstwhile Department of Telecommunications (DoT) period.

The reply was not justified as BSNL, after its formation in the year 2000, had sufficient time at its disposal to review the progress of the projects which were conceived during DoT period and to identify routes where OFC were already commissioned and to take suitable remedial action instead of going ahead with technologically redundant projects.

Office of CGM NTR stated that M/W systems were installed as an alternate media.

2.8.1.2 Delay in installation of Lawful Interception and Monitoring and International Private Leased Circuits

Lawful Interception and Monitoring (LIM) systems are used to determine the type and contents of traffic passing through BSNL's own international gateway switches over the International Private Leased Circuits (IPLC). LIMs over IPLCs help in intercepting unlawful traffic. BSNL placed a purchase order in August 2004 for the supply of LIMs for installation in five international gateway switches at Delhi, Kolkata, Chennai, Mumbai and Ernakulam and another purchase order in August 2007 for installation of IPLC-LIM at five locations viz., Chennai, Kolkata, Mumbai, Tuticorin and Ernakulam. The respective Maintenance Regions were the consignees for the equipment.

It was observed that equipment at Ernakulam costing Rs. 2.42 crore was not commissioned till August 2009. Similarly, the equipment at Chennai costing Rs. 3.42 crore which was received in December 2007 was commissioned only in March 2009. Delay in commissioning was attributed to the failure in clearing A/T. Though the bidder failed to demonstrate all the functionalities of the equipment, no action was taken against the vendor. Besides idling of equipment worth Rs. 5.84 crore, the delay in commissioning of IPLC-LIM led to postponement of the start of IPLC services in these stations. Similarly, in ETR also, the IPLC-LIM meant for Kolkata received in January 2008 has not started service yet.

On being pointed out, the Management of STR accepted (October 2009) that IPLC service from Ernakulam could not be started due to pending clarifications from BSNL Corporate office on certain issues. It was also informed that liquidated damages would be recovered from the vendor for delay in commissioning.

Recommendation No. 2.1

BSNL may review and strengthen its planning and execution processes by authorising the Maintenance Regions to conduct mid course review of projects for reducing the long gestation periods of transmission projects.

2.8.2 Weak controls in asset management

As the custodian of the transmission network it is important that Maintenance Regions should have strong internal systems in place to monitor the expenditure of network maintenance and to manage its assets.

As per Company rules all stores should be taken into stock immediately on its procurement and all the utilisation details should also be maintained. However, it was observed in Patna sub region of ETR that no records were maintained relating to receipt, stock and issue of ordered quantity of stores valuing Rs. 23.36 crore procured during 2004-05 to 2008-09 through 94 purchase orders. In the absence of stores records details of their utilisation also could not be ascertained.

On being pointed out, the local unit agreed to maintain the necessary records.

It was also noticed in ETR that in July 2007 and May 2008 ETR procured 45 OTDR[♦] equipment against the actual requirement of only nine equipment, resulting in excess procurement of 36 OTDR equipment worth Rs. 1.57 crore. The excess procurement was justified by ETR unit as spares. But maintenance spares for three years were given by the suppliers free of cost in the purchase of optical testing instruments. As per BSNL's

[♦] *Optical Time Domain Reflectometer*

norms, the requirement of OTDR equipment was stipulated as one set for every 250 km and one set at the headquarters office in each sub-region.

On being pointed out in Audit, ETR Management admitted that the actual purchase was in excess of requirements.

Recommendation No. 2.2

BSNL may strengthen the control and monitoring mechanism in relation to accounting of stores so as to improve its inventory management.

2.8.3 Billing and collection of revenue

With the entry of private service providers in telecommunication sector it became important for all operators to have interconnection with each other and since BSNL being the major player in the telecom field, all other operators essentially required to use BSNL network for a variety of services. Maintenance Regions are responsible for giving connectivity through Level I TAX1 and providing Points of Interconnection (POIs) to the private operators and for billing and collection of revenue for service provided through it. Audit observations on the revenue related functions of the Maintenance Regions are discussed below:

2.8.4 Delay in finalisation of tariffs for use of signaling through Stand Alone Signaling Transfer Point system

BSNL decided (January 2004) to introduce Stand Alone Signaling Transfer Point (SSTP) systems into its network with a view to achieve better flexibility and transparency of its signaling networks and to facilitate introduction of new services in both wire line and Cellular services. The system was also targeted to help the BSNL to measure/record its signaling links which were used by private operators for their national and international roaming subscribers and to bill them accordingly. As per the terms and conditions of the Interconnect Agreements with the private service providers, all signaling links from the network of private operators should pass through the SSTP and the BSNL reserved the right to levy charges for use of the expensive CCS7* signaling resources of BSNL. For value added services like auto roaming services, the charges to be levied were fixed as Rs. 25 and Rs. 50 per month per subscriber for national and international roamers respectively and for SMS services, charges were not finalised. The installation of SSTP systems in different Level I TAXs was planned to be completed in three phases and equipment was to be procured from M/s ITI Limited. As per the projections of the Company a system of 300 links was expected to earn a profit of Rs. 4.45 crore per year at 80 per cent capacity utilisation. BSNL incurred a total cost of Rs. 138.62 crore (**Annexure II**) on the SSTP equipment for all the three phases. Phase I of the project was completed in 2005 and Phase II in December 2007. Nailed up connectivity was also provided to private operators. Phase III which was for up gradation of the first two phases was not declared as commissioned as of August 2009. The Company had established 22,200 links spread over the country in different Level I TAX exchanges.

* Common Channel Signaling- is a set of telephony signaling protocols used to set up telephone calls of public switched telephone network. Other uses include number translation, prepaid billing mechanism, short message service (SMS), etc.

It was noticed (August 2009) in STR that the SSTP system was not capable of identifying the exact number of roamers for billing as the required fields for this feature were not incorporated by the vendor into the system and the billing functionality of the system was not made operational. On being pointed out, office of CGM STR replied (September 2009) that the vendor had rectified all the deficiencies and the billing would commence after finalisation of tariff by BSNL Corporate office. Thus, in the absence of appropriate charges for the use of CCS-7 signals by private operators for messaging, the Company could not earn any revenue from the investment on SSTP equipment despite acquiring the capability to measure and bill it. Based on BSNL's own projections, the investment had the potential of earning a profit of Rs. 329.30 crore per annum, and the failure in fixing tariffs had deprived the Company of the projected profit.

Recommendation No. 2.3

BSNL may fix tariff and realise charges from private operators for use of CCS-7 signals as stipulated in the Interconnect Usage Charges agreements.

2.8.4.1 Delay in provisioning of Point of Interconnection (POI) to private operators

Departmental instructions stipulate that Point of Intersection (POI) requested by other operators should be provided within a period of 30 days from the date of payment of provisional demand note towards rent. In cases where the E1 ports were ready but there was delay on the part of private operators in Acceptance Testing (A/T) or in commissioning, rent would start on expiry of said date without waiting for commissioning of ports.

Audit Scrutiny at NTR, ETR and WTR revealed that there were delays ranging up to 570 days on the part of the Maintenance Regions in providing POIs to different private operators denying Company the potential revenue of Rs. 3.06 crore (***Annexure III***).

On being pointed out, the Management of NTR attributed the delay to late receipt of Advice notes and non-cooperation of private operators in the A/T processes. The Management of WTR (Rajkot) stated that supplementary bills for port charges amounting to Rs. 14.96 lakh were issued in August 2009. Reply from ETR was awaited (November 2009).

2.8.4.2 Outstanding Interconnect Usage Charges

Inter Operator Billing and Accounting System (IOBAS) Procedure Order (April 2005) and the Interconnect agreements with other licensed operators described the procedure for resolving disputes in the Interconnect Usage Charges (IUC). Maintenance Regions were responsible for the collection of IUC from National Long Distance (NLD) and International Long Distance (ILD) licencees.

It was seen in all the four Maintenance Regions that IUC bills amounting to Rs. 43.94 crore (***Annexure IV***) could not be collected due to disputes with the private operators. Of the total Rs. 43.94 crore, outstanding under ETR was Rs. 37.18 crore which constituted nearly 85 *per cent*. With the introduction of the computerised billing system of IOBAS in 2005 and clear dispute resolving mechanism in place, outstanding IUC bills should have been reduced to the minimum.

On being pointed out the Management of ETR replied that action was being taken to realise the outstanding dues.

Recommendation No. 2.4

BSNL may initiate urgent action to collect outstanding Interconnect Usage Charges from private operators by invoking relevant provisions of the Interconnect Usage Charges agreements.

2.9. Conclusion

Maintenance Regions, being the custodian of the transmission network of the BSNL, play a vital role of ensuring trouble free transmission. BSNL being the owner of the largest transmission network in the country has the advantage of offering bandwidth on demand to all prospective users. Thus, the contribution of the Maintenance Regions in the revenue generation process of the Company is crucial. Use of the best technology in the industry, keeping the assets trim through timely disposal of obsolete goods, billing and collection of revenue from all sources and effective marketing strategies are important activities for optimising the network efficiency and thereby enhancing revenue. Even though the Maintenance Regions were keeping interruptions within the acceptable limits, Audit findings as brought out in the report revealed that a more pro active role in the planning and execution of transmission projects, tighter control mechanism and better marketing initiatives in providing bandwidth would help the BSNL in maximising the investments in the transmission segment.

The matter was reported to the Ministry in February 2010; their reply was awaited (March 2010).