

REPORT ON 5 DAYS INTERNSHIP ON “OPERATIONS OF OPTICAL FIBER, POWER PLANT, BASE TRANSMISSION SYSTEM AND BATTERIES” IN BSNL

Submitted in partial fulfilment of the requirements for the completion of
PROFESSIONAL TRAINING

By

MANIKANDAN R (41140055)



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING
SCHOOL OF ELECTRICAL AND ELECTRONICS**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with grade “A++” by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI – 600119

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SATHYABAMA

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Department of Electrical and Electronics Engineering

Bonafide Certificate

This is to certify that this Report is the bonafide work of **MANIKANDAN R (41140055)** who carried out the internship entitled **“Operations of Optical fiber, Power plant, Base transmission system and Batteries”** under my supervision from 07-08- 2023 to 11-08-2023

Head of the Department
(DR.S. RADHIKA)

Submitted for Viva voce Examination held on _____

INTERNAL EXAMINER

(Signature)

EXTERNAL EXAMINER

(Signature)

DECLARATION

I, **MANIKANDAN R** here by declare that the Report entitled **“Operations of Optical fiber, Power plant, Base Transmission system and Batteries”** is submitted in partial fulfilment of the requirements for the award of Bachelor of Engineering degree in **ELECTRICAL AND ELECTRONICS ENGINEERING**.

DATE: 07-08-23 to 11-08-23

PLACE: TRICHY


Manikandan R
(Signature of the candidate)

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this Report and for completing it successfully. I am grateful to them.

I convey my thanks to **DR. N. M. NANDHITHA, Prof. & Dean, School of Electrical and Electronics Engineering** and **DR.S. RADHIKA, Head of the Department, Dept. of ELECTRICAL AND ELECTRONICS ENGINEERING** for providing me necessary support and details at the right time during the progressive reviews.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of **Electrical and Electronics Engineering** who were helpful in many ways for the completion of the Report.

(Name of the Candidate)
Manikandan R

PREFACE:

Organizations are made up of people and function through people. Without people, organizations cannot exist. The resources of men, money, material, machinery, and mechanism are connected, coordinated and utilized through people. Engineers need to concentrate more on mechanism and the way in which things have been made. The need of training arises for doing things yourself, understanding its way.

Practical exposure for doing things makes a person conversant to the technicalities involved in any job. In view of such benefits, imparting of vocational training has been made an integral part of any academic structure.

During the 5 days internship at BSNL, I visited various power generation and distribution plants in the industry. I related the concepts which I have learnt in my academics. The campus had a thermal power plant and I was explained about the working. I gained relevant knowledge which will help me in my academic journey.

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1. Introduction about the company:

1.1) History of BSNL:

Bharat Sanchar Nigam Limited is India's government enterprise and its history can be traced back to the British India. The foundation of telecom network in India was laid by the British sometime during the 19th century. During the British era, the first telegraph line was established between Calcutta and Diamond Harbor in 1850. The British East India Company started using the telegraph in 1851 and until 1854 telegraph lines were laid across the country. In 1854, the telegraph service was opened to the public and the first telegram was sent from Mumbai to Pune. In 1885, the Indian Telegraph Act was passed by the British Imperial Legislative Council. After the bifurcation of Post and Telegraph department in the 1980s, the creation of Department of Telecom eventually led to the emergence of the government owned telegraph and telephone enterprise which led to the foundation of BSNL.

For 160 years, BSNL had operated the public telegram service. In 2010 the telex network between its 182 offices was replaced with the "Web Based Telegram Messaging System" which relied on internet connections rather than telex lines (which are more reliable where power outages are more common). This led to a decline in service, and the company applied the title "diminished service" to telegrams in 2010. Finally on 15 July 2013 the public telegram service was shut down completely.

1.2) Products and services:

Telephone and Mobile

BSNL provides both fixed line telephones and mobile telephony services.

1. Main article: BSNL Mobile:

BSNL Mobile is a major provider of GSM network under brand name Cell One and BSNL all over India. It has wide network coverage in both urban and rural areas of India. It has over 121.82 million customers across India.

BSNL Mobile offers prepaid, postpaid services and value-added services such as Free Phone Service (FPH), India Telephone Card (Prepaid card), Account Card Calling (ACC), Virtual Private Network (VPN), Tele-voting, Premium Rate Service (PRM). It also offers the IPTV which enables customers to watch television through the Internet and Voice and Video Over Internet Protocol (VVoIP).

2. BSNL Landline:

BSNL Landline was launched in early 1990s. It was the only fixed-line telephone serving for whole country before the New Telecom Policy was announced by the Department of Telecom in 1999. Only the Government-owned BSNL and MTNL were allowed to provide land-line phone services through copper wire in the country. BSNL Landline is the largest fixed-line telephony in India. It has over 9.55 million customers and 47.20% market share in the country as of 28 February 2021.

3. Internet:

BSNL is the fourth largest ISP in India, with having presence throughout the country. It also has the largest fiber-based telecom network in the country, around 7.5 lakh kilometers, among the four operators in the country

4. BSNL Broadband:

BSNL Broadband provides telecom services to enterprise customers including MPLS, P2P and Internet leased lines. It provides fixed-line services and landline using CDMA technology and its own extensive optical fiber network. BSNL provides Internet access services through dial-up connections as prepaid, NetOne as postpaid, and DataOne as BSNL Broadband.

5. BSNL Bharat Fiber:

BSNL Bharat Fiber (FTTH) was launched in February 2019. It offers TV over IP (IPTV), Video On-Demand (VoD), Voice over Internet Protocol (VoIP), Audio On-Demand (AoD), Bandwidth On-Demand (BoD), remote education, video conferencing services, interactive gaming, Virtual Private LAN services. BSNL said that, its huge optic fiber network provides fixed access to deliver high-speed Internet up to 300 Mbit/s.

CHAPTER 2

2.INTERSHIP OVERVIEW:

2.1) DAY 1: Optical Fiber Insights

- Commenced the day with an introduction to optical fiber communication principles.
- Discussed the significance of optical fibers in modern telecommunications.
- Explored the optical fiber laboratory, gaining practical experience in splicing optical fiber cables.
- Studied fiber optic connectors and their applications.
- Developed a fundamental understanding of optical fiber's role in high-speed data transmission.
- Acquired hands-on skills in handling and splicing optical fiber cables.



• Fig.1

- Optical fibers are flexible fibers of glass that are as thin as a single strand of hair. These fibers transmit information in the form of light signals from one point to another, through a fiber optic cable composed of hundreds to thousands of optical fibers

2.2) Day 2: Power Plant Operations

- Initiated the day with an overview of power plants and their importance in network uptime.
- Explored various power sources used in telecommunications.
- Conducted an informative tour of the BSNL power plant, observing backup generators and battery banks.
- Emphasized the significance of redundancy in power supply.
- Gained insights into the critical role of power plants in ensuring uninterrupted telecom services.
- Explored different power backup solutions utilized for network reliability.



Fig.2

- Matter regarding the existing quality of maintenance of Power plant and approach required for improving the maintenance of the Power Plants, is under active consideration at BSNL CO. At present the working life of a SMPS power plant is fixed as 15 years.

2.3) Day 3: Base Transmission Systems

- Delved into the concept of base transmission systems (BTS) and their role in signal transmission.
- Explored the equipment employed in base transmission stations (BTS).
- Visited a live BTS site, witnessing the setup of transmission equipment.
- Explored signal modulation and demodulation processes.
- Discussed the challenges and maintenance of BTS equipment.
- Acquired practical knowledge of BTS and its integral role in network communication.
- Understood the importance of meticulous BTS maintenance for reliable telecom services.



Fig.3

- A base transceiver station (BTS) is a fixed radio transceiver in any mobile network. The BTS connects mobile devices to the network. It sends and receives radio signals to mobile devices and converts them to digital signals that it passes on the network to route to other terminals in the network or to the Internet.
- A base transceiver station (BTS) is a piece of equipment that facilitates wireless communication between user equipment (UE) and a network. UEs are devices like mobile phones (handsets), WLL phones, computers with wireless Internet connectivity, or antennas mounted on buildings or telecommunication towers.

2.4) Day 4: Battery Backup Systems

- Initiated the day by understanding battery backup systems in telecommunications.
- Explored different battery types, including lead-acid and lithium-ion.
- Visited the battery backup unit, observing battery bank setups.
- Studied battery charging and monitoring systems.
- Highlighted the importance of regular battery testing and maintenance.
- Developed a comprehensive understanding of battery backup systems and their pivotal role in network reliability.
- Explored the distinctions between various battery types and their specific applications.



Fig.4

- Presently in both BSNL and MTNL, most of the batteries are based on AGM VRLA technology. Almost all the Power Plants in the field are SMPS Power Plants, compatible with VRLA batteries.
- Matter regarding the existing quality of maintenance of Power plant and approach required for improving the maintenance of the Power Plants, is under active consideration at BSNL CO. At present the working life of a SMPS power plant is fixed as 15 years.

2.5) Day 5: Summary and Conclusion

- Commenced the day with a recap of the internship, consolidating the key topics and experiences.
- Explored the practical applications of the knowledge gained.
- Presented a succinct summary report on the internship to the BSNL team.
- Engaged in a productive Q&A session with experienced BSNL professionals.
- Summarized the enriching journey during the internship, expressing gratitude for the opportunity.
- Acknowledged the wisdom and mentorship received from the seasoned BSNL team.

This revised report maintains a professional tone and structure while providing a concise overview of your five-day internship at BSNL.

CHAPTER 4

CONCLUSION:

In conclusion, my internship at BSNL provided me with a valuable opportunity to gain practical insights into various aspects of Electrical and Electronics Engineering. Over the course of five days, I had the privilege of delving into optical fiber technology, power plant operations, base transmission systems, and battery backup systems.

This experience not only allowed me to apply the theoretical knowledge I've acquired in my undergraduate studies but also exposed me to real-world challenges and solutions in the telecommunications industry. It was a platform for me to develop problem-solving skills, enhance my teamwork abilities, and build valuable connections with professionals in the field.

APPENDIX:

