Vol. 1, No. 4; Oct – Dec (2025)

SAKHA: Multidisciplinary Journal of Science, Arts & Technology

Available at https://sakha.co.in/journals/mjsat

Historical and Administrative Analysis of Bharath Heavy Electricals Limited (Bhel) at Ranipet – A Study

K. Prakash Babu[1a], and Dr. P. Thiripurasundari[2]

[1]Ph.D., Research Scholar (Part Time) PG and Research Department of History, Arignar Anna Government Arts College, Cheyyar. (Affliated to Thiruvalluvar University, Vellore).

[2]Assistant Professor & Head, PG and Research Department of History, Arignar Anna Government Arts College, Cheyyar.

Abstract

This study examines the historical development and administrative structure of Bharat Heavy Electricals Limited (BHEL) in Ranipet. Established as part of India's post-independence industrialization policy, the Ranipet unit played a significant role in strengthening the country's heavy electrical equipment manufacturing sector. The research traces the origin and growth of BHEL in Ranipet, highlighting its contribution to regional industrial development, employment generation, and technological advancement. The study also analyzes the administrative set-up of the organization, including its hierarchical structure, functional divisions, decision-making processes, and managerial practices. By examining primary and secondary sources, the research evaluates how administrative efficiency contributed to productivity and organizational growth. The study concludes that the historical evolution and structured administration of BHEL Ranipet significantly influenced both industrial progress and socio-economic development in the region.

Keywords: *BHEL Ranipet, Administrative Structure, Heavy Electricals Industry, Industrial Development.*

[a] Corresponding Author: kprakashbegin@gmail.com

https://doi.org/10.66219/sakha.multi.v1.i4.1026

Introduction

Industrialization has played a significant role in shaping the economic and social transformation of modern India. Public sector enterprises, in particular, have contributed immensely to the development of heavy industries, infrastructure, and employment opportunities. Among these, Bharat Heavy Electricals Limited (BHEL) occupies a prominent position as one of the largest engineering and manufacturing enterprises in the country. Established with the objective of strengthening India's power and industrial sectors, BHEL has expanded its operations across various regions, including Ranipet in Tamil Nadu, which emerged as an important industrial centre.

The establishment of BHEL at Ranipet marked a crucial milestone in the industrial growth of the region. Prior to industrialization, Ranipet and its surrounding areas were largely dependent on agriculture and small-scale activities. The arrival of BHEL not only accelerated industrial development but also contributed to urbanization, infrastructure improvement, and socio-economic transformation. This study aims to examine the historical background of BHEL in Ranipet and analyze its administrative set-up.

History of BHEL in India

BHEL is India’s largest engineering and manufacturing enterprise in the energy and infrastructure sectors. Established in 1964, BHEL is a leading power equipment manufacturer globally and one of the earliest and leading contributors towards building an Aatmanirbhar Bharat. BHEL, India’s very own heavy electrical equipment industry, serve the customers with a comprehensive portfolio of products, systems and services in the areas of power-thermal, hydro, gas, nuclear & solar PV; transmission; transportation; defence & aerospace; oil & gas and new areas like BESS and EV chargers.

Origin of BHEL in Ranipet

One of the greatest challenges before the Government of India on attaining freedom in 1947 was to provide a strong base in infrastructure and capital goods for economic and industrial development. The Government under the leadership

of Prime Minister, Pandit Jawaharlal Nehru realized that there should be a large manufacturing base and adequate technically qualified personnel for sustained economic growth.

The Planning Commission recommended initiating steps towards setting up a factory for the manufacture of all types of heavy electrical equipment required for various projects.

As a result, the Government of India signed an agreement on 17th November, 1955, with Associated Electrical Industries (AEI), UK, for the establishment of a factory at Bhopal complete in all respects for the manufacture of heavy electrical equipment in India. The company was registered as Heavy Electricals (India) Limited (HE(I)L) in the Public Sector under the Ministry of Industry and Commerce on 29th August, 1956.

The origin of BHEL in Ranipet is closely linked to India's industrial expansion during the late twentieth century. In the mid-1980s, BHEL established several specialized smaller plants to diversify its production capabilities. One of these was the Boiler Auxiliaries Plant (BAP) at Ranipet. This unit was created to manufacture equipment required for thermal power stations such as fans, dampers, heat exchangers, and pollution-control systems.

Administrative Set Up

Research Development

BHEL places strong emphasis on innovation and creative advancement, which leads to the development of technologically competitive products and services. The research and developmental efforts of the company are not only aimed at improving the performance of the products of current manufacture, but also developing new products and systems using state-of-the-art technologies, relevant to the needs of the various business sectors. Spearheading this process is BHEL's highly qualified manpower engaged in R&D activities in the Corporate R&D Division, Hyderabad, and the Research and Product Development (RPD) centers at its manufacturing units

To carry out research in identified specialized areas, BHEL has established 14 Centres of Excellence. The Corporate R&D Division is currently equipped with ten Centers of Excellence (COE) carrying out advanced R&D in engineering

disciplines like, Simulators, Computational Fluid Dynamics (CFD), Permanent Magnet Machines (PMM), Surface Engineering, Intelligent Machines and Robotics, Machine Dynamics, Compressor and Pumps, Nano Technology, Ultra High Voltage (UHV) and Advanced Transmission Systems. Two COEs, for Power Electronics, IGBT and Controller Technology, and for Control and Instrumentation (C&I), are located at Electronics Division, Bengaluru. Two COEs, for Advanced Fabrication Technology and Coal Research Centre, are established the Tiruchirappalli unit.

In addition, BHEL has also established five specialized institutes to pursue R&D in identified areas. They are Welding Research Institute (WRI) at Tiruchirappalli, Ceramic Technological Institute (CTI) at Bengaluru, Centre for Electric Traction (CET) at Bhopal, Pollution Control Research Institute (PCRI) at Haridwar and Amorphous Silicon Solar Cell Plant at Gurugram.

R&D Strength & Innovation Capabalities

BHEL has a strong engineering and R&D base for in-house development of technologies to address the market requirements, and is also focusing on flow of knowledge and information throughout the innovation ecosystem for growth of its workforce.

BHEL'S Centres of Excellence

Centre of Excellence for Simulators:

Centre of Excellence for Simulators (COE-S) highlights the power plant simulation capabilities of BHEL. Having the core expertise in power plant domain, the following products and services were developed and offered by COE-S:

Centre of Excellence for Computational Fluid Dynamics:

Centre of Excellence for Computational Fluid Dynamics (COE-CFD) has design and analysis capability of various power and industrial products, equipped with advanced software and hardware and manned by technically capable and trained personnel.

Centre of Excellence for Permanent Magnet Machines:
The Centre of Excellence for Permanent Magnet Machines (COE-PMM) has been established to develop in-house design and technology for manufacturing permanent magnet machines with high-energy magnets for various applications.

Centre of Excellence for Surface Engineering:
Centre of Excellence for Surface Engineering (COE-SE) augments BHEL's predominant position as a pioneer in carrying out R&D in surface engineering which has been successfully implemented at various power stations, industrial establishments, space programmes and other important applications in the highly specialized area of surface coatings and treatment.

Centre of Excellence for Intelligent Machines and Robotics:
Centre of Excellence for Intelligent Machines and Robotics (CIMAR) has established for continuing research in manufacturing automation and application oriented robotics.

Centre of Excellence for Machine Dynamics:
Centre of Excellence for Machine Dynamics has established for continuing research in Machine Dynamics. This centre's facilities include state of art noise and vibration analyzers, software tools for prediction of noise and vibration characteristics, telemetry system, expert diagnostics and vibration monitoring systems, seal test rig, CAD workstations, etc.

Centre of Excellence for Compressors & Pumps Dynamics:
Centre of Excellence for Compressors and Pumps (COE-CP) has set up to take-up projects to meet the needs of BHEL units in the field of centrifugal compressors, axial compressors, ID fans, pumps and steam turbines for various industrial and power plants applications.

Centre of Excellence for Nano Technology:
Centre of Excellence for Nano Technology carries out the research and development of nanomaterials for various applications related to BHEL. The center is equipped with various state of the art instruments for nanomaterial synthesis and characterization.

Centre of Excellence - Ultra High Voltage Laboratory:

The Centre of Excellence – Ultra High Voltage Laboratory (COE-UHV) has two distinct functional areas:

High Voltage Dielectric Test Facility

Centre for Assembly of Gas-Insulated Substation (GIS) modules in controlled environment. This laboratory facilitates testing of all GIS modules as per IEC standards and in reducing the development cycle time of GIS equipment.

Centre of Excellence for Advanced Transmission Systems:

Centre of Excellence for Advanced Transmission Systems (COE-ATS) has been established for addressing technologies related to bulk power transmission emanating from growth of energy generation in India. The centre aims to develop technologies pertaining to HVDC, UHVAC up to 1200 kV, reactive power management, substation automation, Wide Area Protection (WAP), etc.

Centre of Excellence for Advanced Fabrication Technology:

The Centre of Excellence for Advanced Fabrication Technology has been established at the Tiruchirappalli unit to develop and introduce highly productive advanced welding processes and technologies to improve quality and productivity of fabrication shops and to enhance R&D capability through addition of state-of-the-art research facility.

Centre of Excellence - Coal Research Centre:

The Coal Research Centre has been established at the Tiruchirappalli unit to take up R&D activities specially focusing on deep understanding of Indian/imported coals with a view to determine its blending parameters including characterisation to improve existing/contemporary technologies and develop new process/system/technologies to achieve lower environmental emission.

Centre of Excellence for Power Electronics and IGBT & Controller Technology:

The Centre of Excellence for Power Electronics and IGBT & Controller Technology has been established at Electronics Division, Bengaluru, to cater for the development needs for transportation electronics with an objective to absorb technologies from collaborators.

Centre of Excellence for Control and Instrumentation:

In order to match the current technology and upcoming challenges in the field of control and instrumentation (C&I), a Centre of Excellence for Control and Instrumentation has been established at Electronics Division, Bengaluru.

Quality Management

BHEL is one of the few organisations which made its Quality foundation strong since its inception. During 1970-90, BHEL implemented Quality Manual for the entire organisation including responsibilities, systems, processes and procedures. Since then BHEL is foremost in Quality Planning, Calibration System and Quality Circle concept in India.

Continuous R&D at manufacturing units and Corporate R&D Centre at Hyderabad, having various Centres of Excellence, are carrying out focused improvement in products and processes.

Human Resources

As an organisation contributing greatly to the growth of the economy, BHEL is a people-strong company with an objective of ensuring employee growth and development. With a sturdy foundation of more than fifty years of engineering excellence, BHEL is a people-centric PSU that has contributed greatly to the growth of the country as a whole.

Skill development

As a dependable name in the engineering sector, BHEL provides a lot of importance to skill development of its employees as is evident from the various

training programmes that are organised in house regularly. Workshops and training programmes are organised at regular intervals to develop management skills, functional skills and also technical skills of the workforce that is an integral part of this employee-oriented company.

Attractive employee benefits

Besides the statutory provision of social security, BHEL continues to extend comprehensive post-retirement benefits to all its employees and their families, both in terms of financial as well as medical benefits. Opportunities are made available for learning and professional development in a wide range of technical and functional areas for employees. Employee engagement practices here are not restricted to excellent training and development benefits. On the contrary, the organisation believes in engaging its employees by way of quarterly feedback on behavioural aspects, cultural events, sports events, town halls, shop councils, plant councils and various management committees for employees.

BHEL fosters a culture of recognising and incentivising the best work done at all levels. Therefore, to reward its employees, in addition to the best employee of the quarter, the company has started the Excel Awards scheme, besides a number of other recognitions.

Achievements

1) 74% of India's Indigenous Nuclear Power Plants have BHEL supplied Turbine Generator Sets.
2) BHEL has been supplying traction motors to Indian Railways since 1962 when the first lot of 16 traction motors for 1500 V DC EMUs in Mumbai was supplied.
3) BHEL has executed the supply of propulsion systems, brake systems, drive systems and traction sub stations right from system design to commissioning for country's first metro railways (Kolkata Metro) in 1982.
4) India's first HVDC project (100 kV, 100 MW National HVDC link) connecting two remote areas of Barsoor in Madhya Pradesh and Lower Sileru in Andhra Pradesh was commissioned by BHEL in 1989. Later it was extended to 200kV, 200 MW.

5) BHEL has successfully implemented second Ultra High Voltage Direct Current (UHVDC) (+800 kV, 6,000 MW) Link between the Western Region Grid (Raigarh, Chattisgarh) and the Southern Region Grid (Pugalur, Tamil Nadu) after successful execution of first UHVDC Transmission Project viz., +800 kV multi-terminal North-East to Agra HVDC project.
6) Indian Navy's indigenous TRISHUL missile launcher has been developed by BHEL.

Conclusion

The study on the history of BHEL in Ranipet and its administrative set-up highlights the significant role played by Bharat Heavy Electricals Limited in promoting industrial growth and socio-economic development in the region. Since its establishment, the Ranipet unit has emerged as an important center for the production of boiler auxiliaries, valves, and other heavy electrical components, contributing substantially to India's power and industrial sectors. The administrative structure of the Ranipet unit demonstrates a well-organized hierarchical framework designed to ensure efficient coordination among various departments such as production, finance, human resources, quality control, and marketing. Furthermore, the presence of BHEL in Ranipet has contributed to employment generation, skill development, and infrastructure improvement in the surrounding areas.

In conclusion, BHEL Ranipet stands as a notable example of successful industrial planning supported by an effective administrative system. Its historical growth and structured management approach have enabled it to sustain competitiveness and fulfill national industrial objectives.

References

1. Bharat Heavy Electricals Limited. History of BHEL. New Delhi: BHEL Corporate Office.
2. Government of India. Land Acquisition for BHEL Units in Tamil Nadu. Ministry of Heavy Industries.

3. "BHEL Ranipet is Best Productive Unit." The New Indian Express.
4. "Ranipet BAP Feat." The New Indian Express.
5. District Industrial Profile of Ranipet, Government of Tamil Nadu.
6. M. Gunasekaran, Vellore Mavatta Varalaru (Tamil), Ramanathan Publishers, Chennai, 2012.