

## **Know More about BHEL**

**BHEL** is the largest engineering and manufacturing enterprise in India in the energy-related/infrastructure sector, today. **BHEL** was established more than 40 years ago, ushering in the indigenous Heavy Electrical Equipment industry in India - a dream that has been more than realized with a well-recognized track record of performance.

**BHEL** manufactures over 180 products under 30 major product groups and caters to core sectors of the Indian Economy viz., Power Generation & Transmission, Industry, Transportation, Telecommunication, Renewable Energy, etc.

The wide network of **BHEL's** 14 manufacturing divisions, four Power Sector regional centres, over 100 project sites, eight service centres and 18 regional offices, enables the Company to promptly serve its customers and provide them with suitable products, systems and services -- efficiently and at competitive prices.

<b>Power Sector</b> - <i>forms the core business sector of BHEL and is involved in Erection, testing and commissioning of power plants. Power Sector has more regions, PEM and other support/services groups.</i>	<b>Manufacturing Units</b> - <i>BHEL has 14 manufacturing Units spread all across India.</i>	<b>Other Divisions</b>
<b>Power Sector - Northern Region</b> <a href="http://www.bhelpsnr.co.in">www.bhelpsnr.co.in</a>	<b>BHEL, Tiruchy</b> <a href="http://www.utilityboiler.com">www.utilityboiler.com</a>	<b>Industrial Systems Group, Bangalore</b> <a href="http://www.bhelisg.com">www.bhelisg.com</a>
<b>Power Sector - Southern Region</b> <a href="http://www.bhelpsr.co.in">www.bhelpsr.co.in</a>	<b>BHEL, Haridwar</b> <a href="http://www.bhelhwr.co.in">www.bhelhwr.co.in</a>	<b>Transmission Business Group, New Delhi</b> (Details given below)
<b>Power Sector - Eastern Region</b> <a href="http://www.jantermanter.com">www.jantermanter.com</a>	<b>BHEL, Bhopal</b> <a href="http://www.bhelbpl.co.in">www.bhelbpl.co.in</a>	<b>Corporate R &amp; D, Hyderabad</b> (Details given below)
<b>Power Sector - Western Region</b> <a href="http://www.bhelpswr.co.in">www.bhelpswr.co.in</a>	<b>BHEL Hyderabad</b> <a href="http://www.bhelhyderabad.com">www.bhelhyderabad.com</a>	<b>Industry Sector, Delhi</b> (Details given below)
<b>Project Engineering Management</b>	<b>EDN Bangalore</b> <a href="http://www.bheledn.com">www.bheledn.com</a>	<b>International Operations, Delhi</b> (Details given below)
<b>PS- SSBG</b>	<b>Transformer Plant Jhansi</b> <a href="http://www.bheljhs.co.in">www.bheljhs.co.in</a>	<b>Corporate Office, Delhi</b> <a href="http://www.bhel.com">www.bhel.com</a>
<b>PS-TS</b>	<b>BAP, Ranipet</b> (Details given below)	
<b>PS-Marketing</b>	<b>HERP Varanasi</b> <a href="http://www.varanasi.bhel.co.in">www.varanasi.bhel.co.in</a>	
<b>PS-PMG</b>	<b>CFP Rudrapur</b>	
	<b>IVP Goindwal</b>	
	<b>Insulator Plant, Jagdishpur</b>	

**Further Details:**

**Currently the requirement is for following Power Projects Sites and Manufacturing Units of BHEL:**

**Project Sites:**

**Power Sector Sites are divided into Four Regions:**

- 1) **Power Sector - Northern Region**
- 2) **Power Sector - Southern Region**
- 3) **Power Sector - Eastern Region**
- 4) **Power Sector - Western Region**

**Power Sector - Northern Region ([www.bhelpsnr.co.in](http://www.bhelpsnr.co.in))**

Power Sector which forms the core business sector of BHEL is divided into four regions Power Sector Northern region is one of these four regions. It is mainly involved in Erection, testing and commissioning of power plants in the states of J&K, Himachal, Uttranchal, Punjab, Haryana, Rajasthan and Uttar Pradesh and National Capital Territory of Delhi. While the project sites located in hill states comprise of Hydro Power Plants ranging upto single units of 250 MW those in the other states comprise mainly of thermal sets of ratings ranging upto 500 MW. Region is also involved in execution of Nuclear power plants and gas based power plants.

Besides this we also provide our valuable customers with after sales services through our regional service centres located at Chandigarh, NOIDA and Varanasi. These centres provide a wide range of high-tech services to our customers like renovation , modernization , uprating, overhauling, residual life assessments and life extension etc.

Region has a consistent track record of profitability and growth right from inception and is poised towards a great future with assured business potential. Performance of sets commissioned by us has been exceptional in terms of PLF and Operating availability thus creating customer confidence in our capability.

It has a highly committed team of talented and experienced engineers who are well known in their field.

With its headquarters at NOIDA we are not only spread over entire north India but we have transcended the boundaries of India and are executing prestigious international power projects in Libya , Sudan , Taiwan and Afghanistan etc.

Our active project sites in India are located at

Himachal Pradesh:

Kullu Manali, Koldam, Parbati , UUL

Uttranchal :

Tehri, Koteshwar, Srinagar, Maneribhalli

J&K :

Sewa, Nimo Bazgo, Chutak

Punjab :

Bhatinda, Mukerian

Rajasthan :

Barsingsar, Dholpur, Chhabra, Giral, Suratgarh

Uttar Pradesh:

Harduaganj, Parichha, Obra, Dadri

Regional Service centres :

Chandigarh, NOIDA, Varanasi

### **Power Sector - Southern Region ([www.bhelpssr.co.in](http://www.bhelpssr.co.in))**

The Power Sector Southern Region, head office at Chennai caters to the needs of various Electricity Boards, Public Sector Undertakings and other Industries in southern Part of the country.

It undertakes **Installation, Commissioning & Servicing** including civil works of: Thermal, gas, nuclear and hydro based EPC & Turnkey projects; Captive power projects; Co-generation Systems; Renovating Old Power Plants Into New Plants; RLA Study; Life Extension Programmes; Supervisory Projects and Renovation & Modernisation of Old Power Stations.

#### **Project Sites:**

PSSR spreads its operations in the states of Tamil Nadu, Andhra Pradesh, Karnataka, Kerala, Orissa, Chattisgarh & Union Territory-Pondichery. The various sites are at Guntur, Muddanur, Kothagudam, Vizag, Vijayawada, Srisalam, Amarkantak, Angul etc

SAS, Secunderabad - Service After Sales

It takes care of Annual & Capital Overhauling; Troubleshooting; Supervisory services.

### **Power Sector - Eastern Region ([www.jantermanter.com](http://www.jantermanter.com))**

Power Sector-Eastern Region of Bharat Heavy Electricals Ltd., is the Eastern Wing of company's Power Sector, with its head office at **Calcutta**, catering its services to the eastern part of India. The states which are being covered are Bihar, Orissa, West Bengal, Assam, Manipur, Meghalaya, Mizoram, Arunachal Pradesh, Nagaland, Tripura and Sikkim.

### **Power Projects Executed by Power Sector : Eastern Region**

**Thermal Projects** Kahalgaon--Korba--Bakreswar--Mejia--Chandrapura -- Santaldih -- Budge Budge -- Lakwa

**IS Projects** Jindal Steel -- Bhushan Steel -- IOCL Haldia

**Hydel Sets** : Tala , Kameng

**Overseas Projects** Mukhaizana -- Qarn Alam -- Tala(Bhutan)

### **Power Sector - Western Region ([www.bhelpswr.co.in](http://www.bhelpswr.co.in))**

**A brief history :**

Power sector Western region was constituted in 1979 locating its head quarters at R.C.Dutt road, Baroda. At the time of re-organizations, PSWR was shifted to Nagpur having its head quarters at Shree Mohini Complex, 345, Kings way, Nagpur. The regional Hq of PSWR is located in heart of Nagpur city, 0.25 KM from Railway Station and 10 KM away from Air port. It has two service centers located one at Nagpur & other at Baroda whose activities are mainly to provide after sales service to customers.

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**Manpower:**

The total manpower strength as on date is 477 out of which 249 Executives, 184 Supervisors & 44 workers. PSWR is also in the process of engaging 30 engineering degree holders on fixed tenure basis for project sites.

**Major Activities:**

The region is executing the power projects in the area of Thermal, Hydro, GAS, Nuclear & Industrial on BTG, EPC on turnkey basis. Western Region is taking care of the customer needs in the state of Maharashtra, Madhya Pradesh, Chhattisgarh, Gujarat & Goa. This region is also executing the projects at Rajasthan, UP & Karnataka, on request from Customers. Currently 18 projects are in operation & the projects are taken from State Electricity boards, NTPC, Reliance, GIPCL, IOCL, Tata, Jindal group of companies, BOR etc. & also overseas projects at Iraq & Sudan. PSWR also executes R&M activities of old power stations presently in operation at Korba (C.G), Ukai & Gandhinagar Gujarat & Dabhol (Maharashtra).

**Turnover :**

The projected turnover for the year 2007-2008 is 1175 crores as compare to last year turnover of Rs.1050 Crores with the PBT of Rs.289 Crores.

**Industrial Systems Group ([www.bhelisg.com](http://www.bhelisg.com))**

Head Office at Bangalore and project sites spread all across India.

BHEL Industrial Systems Group (ISG) was established in 1977 with the objective of enhancing business capability in the area of Industrial drives, controls and automation systems. It is the Engineering Center of BHEL for Industry Sector.

ISG has executed over 250 major contracts executed successfully. It has attained market leadership in India in the areas of Drives, controls & Automation Systems.

**Projects and Services:**

ISG undertakes and executes projects of any size - from concept to commissioning as a Strategic Business Unit (SBU) for each business segment. Under this SBU concept each business group headed by a Business Manager handles a project from marketing till the commissioning and handing over the systems.

There are three Business Groups addressing different business areas:

Business Group - I - Bulk Material Handling (Coal Handling Plant, Ash Handling Plant, Port Handling, Automated Storage & Retrieval System) and DG Sets.

Business Group - II - Transmission & Distribution, Energy Management, New Business Areas.

Business Group - III - Water Management, Balance of Plant for Power Plants.

Business Group - IV - Oil Sector, Metallurgical Industries, Automation, SCADA, Inter Unit Business.

### **Transmission Business Group**

Head Office at New Delhi and project sites spread all across India.

After the formation of Industry Sector in 1982, Transmission Business Group was made the single-point contact for marketing and sale of transmission equipment and systems. The main products, systems and services were identified as switchgear, substation, transmission portion of turnkey power projects, series and shunt compensation schemes, HVDC transmission schemes, load dispatch centers, power system studies etc.

The Group was also assigned the responsibility of rationalization of manufacturing facilities and up-gradation of technology in this area. The Group also undertook the system engineering for transmission projects.

#### ***Manufacturing Units/Other Divisions of BHEL at:***

**Tiruchy, Bhopal, Haridwar, Hyderabad, EDN Bangalore, Jhansi, Ranipet, Varanasi, Corporate R&D, Industry Sector and International Operations Delhi**

#### **BHEL, Tiruchy ([www.utilityboiler.com](http://www.utilityboiler.com))**

BHEL Tiruchirapalli is the largest engineering and manufacturing complex of its kind in the southern state of Tamilnadu and one of the world's leading manufacturers of steam generators for power generation and industrial applications.

Situated on the banks of the Cauvery river around 340 km from the state capital Chennai, Tiruchirapalli (also known as Tiruchi, Trichy or the Rock City on account of its famous Rockfort) is located at the geographical centre of Tamilnadu and is well connected by rail, road and air. The city is a renowned centre for education and is home to well-known educational institutions like the St Joseph's College and the National Institute of Technology (formerly Regional Engineering College) in addition to a large number of reputed schools and colleges offering quality education in the arts, sciences and engineering.

BHEL's Tiruchirapalli Complex comprising the High Pressure Boiler Plant and the Seamless Steel Tube Plant located at Tiruchirapalli, the Piping Centre at Chennai and the Industrial Valves Plant at Goindwal (Punjab) currently has around 9,000 employees and is one of the four major manufacturing divisions of the BHEL Corporation.

Its product range includes Steam Generators of various types of up to 1000 MW rating for utility applications, industrial boilers of up to 300 tons/hour capacity, heat recovery steam generators for combined cycle and co-generation applications, bubbling bed and circulating fluidized bed combustion boilers for producing useful energy from low grade coals, lignite, bagasse, coal washery rejects, straw, husk and waste liquors, chemical recovery boilers, high pressure valves for utility and industrial applications, oil field equipment including wellheads and christmas tree valves for on-shore and off-shore applications, seamless steel tubes and pipes of various types for boiler applications, steam generators and reactor headers for nuclear power plants, advanced technology products, etc. BHEL Tiruchi also provides a wide range of services including residual life assessment, thermal performance assessment and renovation and modernization retrofits for thermal power plants. BHEL Tiruchi is also one of India's leading centres for coal based R&D with several sophisticated test facilities including Asia's Largest Fuel Evaluation Test Facility for characterization of Indian coals.

BHEL's 3000 acre campus at Tiruchirapalli includes a modern township which has over 5,500 residential quarters with shopping centres in each of the four major sectors, hostels, nine campus schools offering top quality school education from kindergarten to standard XII in the CBSE, State Board and Matriculation streams, a full-fledged community centre with facilities for recreation including weekly movies, library, sports and games for employees and their families, cable TV, various cultural associations for promoting the arts and culture of other states, ladies' clubs, a swimming pool located in the officers' club, community reading rooms, a children's park, tennis club, etc.

#### **BHEL, Haridwar ([www.bhelhwr.co.in](http://www.bhelhwr.co.in))**

Bharat Heavy Electricals Ltd.(BHEL) Haridwar has two manufacturing plants:-

Heavy Electrical Equipment Plant (HEEP) and Central Foundry Forge Plant (CFFP).

The Heavy Electricals Equipment Plant (HEEP) located in Haridwar, is one of the major manufacturing plants of BHEL. The core business of HEEP includes design and manufacture of large steam and gas turbines, turbo generators, hydro turbines and generators, hydro turbines and generators, large AC/DC motors and so on.

Central Foundry Forge Plant (CFFP) is engaged in manufacture of Steel Castings: Upto 50 Tons Per Piece Wt & Steel Forgings: Upto 55 Tons Per Piece Wt.

HEEP & CFFP have been awarded ISO-9001 and ISO-9002 certificates respectively. HEEP & CFFP units of BHEL, Haridwar have also been awarded ISO-14001.

#### **BHEL, Bhopal ([www.bhelbpl.co.in](http://www.bhelbpl.co.in))**

#### **BHEL Hyderabad ([www.bhelhyderabad.com](http://www.bhelhyderabad.com))**

As a member of the prestigious 'BHEL family', BHEL-Hyderabad has earned a reputation as one of its most important manufacturing units, contributing its lion's share in BHEL Corporation's overall business operations.

The Hyderabad unit was set up in 1963 and started its operations with manufacture of Turbo-generator sets and auxiliaries for 60 and 110 MW thermal utility sets.

Over the years it has increased its capacity range and diversified its operations to many other areas. To day, a wide range of products are manufactured in this unit, catering to the needs of variety of industries like Fertilisers & Chemicals, Petrochemicals & Refineries , Paper, sugar, steel , etc.

BHEL-Hyderabad unit has collaborations with world renowned MNCs like M/S General Electric, USA, M/S Siemens,Germany, M/S Nuovo Pignone, etc.

Major products of our unit's manufacture includes the following.

- Gas turbines
- Steam turbines
- Compressors
- Turbo generators
- Heat Exchangers
- Pumps
- Pulverisers
- Switch Gears
- Gear Boxes
- Oil Rigs
- Project Engineering

**EDN Bangalore:**( [www.bheledn.com](http://www.bheledn.com) )

The Electronics Division(EDN) of BHEL was formed in 1976, mainly to establish a strong base in the areas of power and industrial electronics and supplement the company's pioneering efforts in power generation, transmission, industry and transportation sectors.

Making a modest beginning in 1976, the unit has registered continuous and impressive growth, which is amply reflected in the fact that a large number of power plants in the country today, are equipped with products and systems made by BHEL-EDN. As reported by the ARC Survey for the year 2005, BHEL is holding over 65 percent of the Market share of DCS Supplies to Power Industry in India (including hardware, software and services).

Technical collaborations with international leaders as well as BHEL-Electronics Division's relentless efforts and unwavering commitment to in-house solutions have contributed to its rapid growth and success. Despite stiff competition posed by the world leaders and domestic private manufacturers, the unit has successfully maintained its growth rate and become a major force to reckon with in power and industrial electronics.

Electronics Division has also been making pioneering efforts in Renewable Energy Sector by commissioning Large-size Grid-Interactive as well as Stand-Alone Solar Power Plants, thus lighting the lives of people living in remote parts of the country. The unit has also been making humble contribution to Indian Space Programmes by fabricating Space Grade Solar Panels and Space Quality Batteries for ISRO.

In recognition of its commitment to the quality systems and procedures, the unit has been certified for ISO 9001 since July 1993. To fulfill its role of a responsible corporate citizen, envisaging protection and conservation of the environment and ensuring that its products and systems are also environment-friendly, BHEL has framed a Corporate Environment Management Policy. Accordingly, the Electronics Division has become the first Electronics Industry in Bangalore to get ISO 14001 Environment Management System Certification and OHSAS 18001 Certification. The Electronics Division has established itself in the field of IT applications, using the state-of-art technology systems, for communication, computing, networking and security requirement of the organisation in achieving its business goal. In this pursuit, the unit has been Certified to ISO/IEC 27001:2005 Information Security Management System from STQC, Ministry of Communication and Information Technology, Government of India.

BHEL has also joined United Nations' "Global Compact" and has committed to support the set of core values enshrined in its ten principles in the area of Human Rights, Labour Standards, Environment and Anti-Corruption.

### **Transformer Plant, Jhansi ([www.bheljhs.co.in](http://www.bheljhs.co.in))**

Bharat Heavy Electrics Limited, Jhansi was founded on 9<sup>th</sup> January 1974 and is a member of vast conglomeration of BHEL Corporation with the corporate office at New Delhi. BHEL has a wide network of 14 manufacturing units, 9 service centers, 4 power sector Regional Centers across the country. It is a multi-product and multi-crore company catering to the core sector demands of Power, Industry, Transmission, Transportation sectors of business in the country and abroad. It achieved a sales turnover of Rs.18838 crores for the year 2006-2007. In this, Jhansi units contribution is Rs. 501 crores.

The Jhansi unit of BHEL is an off-shoot of the Bhopal plant and started production of 132 KV Power, Special and 220 KV Instrument Transformers in the year 1976. Over the period, it has developed new products and diversified into new product areas. Today the unit caters to the following products and services :

- Power Transformers up to 260 MVA in 220 KV class.
- Special Transformers like Rectifier, Furnace, Traction, ESP Transformers, Reactors etc.
- Dry type transformers and Reactors.
- Current and Voltage Transformers in 220 KV class.
- Bus Ducts
- AC and AC/DC Electric Locomotives Diesel Locomotives up to 2600 HP.
- New Product – BPRV, DETC, DG Set, Hoist Assembly, Battery Powered Loco, Dynamic Tracks Stabilizer.,
- Supply of spares and supervision of Erection, Commissioning and Services for above products.

BHEL Jhansi have a committed work force of about 1745 employees (240 Executives, 267 Supervisors and 1238 Workers).

### **BAP, Ranipet**

BHEL, Trichirapalli launched its Phase-III expansion during 1980 for augmentation of manufacturing capacity. Thus the Boiler Auxiliaries Plant, the 13th manufacturing unit of BHEL was set up at Ranipet as a part of the relocation of facilities from Trichirapalli unit.

BAP is located in 1400 acres site. Ranipet is a town enveloped with many ancillary units and Boiler Auxiliaries Plant is a jewel adorning the crown of Ranipet.

### LOCATION

Ranipet is located 120 Kms away from Chennai (Capital of Tamilnadu) towards Bangalore (NH 4). The nearest railway station to Ranipet is Katpadi railway station which is one of the prime railway stations from Chennai to Bangalore. All trains bound for Bangalore make halt at Katpadi Railway station and our unit is twenty three kms away from Katpadi railway station. The nearest Airport is Chennai only and from Chennai to BAP unit both the road and train are feasible.

At present the major Product Profile of this plant is as follows:

- ELECTROSTATIC PRECIPITATORS
- AIR PRE-HEATERS
- FAN
- DESALINATION PLANT

### FACILITIES

BAP has a shop floor area of around 93000sq.meters and has the state-of-art manufacturing facility along with necessary inspection and testing facility. The manufacturing facilities include sophisticated CNC turning and Machining centers, Lathes, Roll Forming Machines, Vertical and Horizontal Borers, Milling Machines, Drilling Machines, CNC Gas cutting machines, Grinding machines, Metal Forming Machines like Press Brakes, Plate Rolling Machines, Section Rolling Machines, Presses etc. The plant has modern welding facilities, Heat treatment facilities and has the capacity to meet stringent quality requirements in fabrication and machining. The inspection and testing facilities include Non-Destructive testing like Ultrasonic Scanning, Radiography and a Modern metrology. BAP has a Dynamic Balancing facility for Fans testing facility for gates and dampers, unique fan testing facility and dedicated R&D facility. It has a separate store area for receipt, storage and issues of raw materials and components to manufacturing areas. It has separate shipping area for dispatch of components to its customers through road and rail.

### TURNOVER

BAP has planned to ramp up its capacity to 10000 MW in the next two years. With additional investment towards advancement, BAP will be in a position to fully meet 10000 MW capacity. BAP surpassed the coveted mark of Rs. 1000 Cr turnover. The year 2006-07 witnessed the turnover of Rs. 1074.50 Crores and the profit before tax was Rs. 126.54 crores. BAP is working towards doubling its growth from the present level of Rs. 1000 Cr to over 2000 Cr in 2009-10.

### HERP Varanasi ([www.varanasi.bhel.co.in](http://www.varanasi.bhel.co.in))

HERP has been established in the vicinity of the power belt in line with BHEL' objective of providing consistent service at the doorstep of our customers.

The foundation stone of the sprawling 30 acres plant at Varanasi was laid on 26th September 1984 and within a short span of 21 months the unit commenced production activities. Having achieved break-even point in the second year of its existence this unit has not looked back since then in its endeavor to grow exponentially. This unit has achieved a turnover of 104 Crores during 2006-07 a quantum jump from about 27 Crores during 2000-2001. It is slated to achieve a turnover of Rs. 130 Crores during the current year.

Starting as manufacturer of Operation and Maintenance spares for Boiler auxiliaries, repair activities took off on a firm footing in 1990 when reabbtting of Turbine Generator set bearings was taken up. Apart from servicing customers in the vicinity such as NTPC Tanda, Unchahar, UPRVNL Obra, Anpara, Parichha, HERP serves far away customers like TNEB, GEB, APSEB and TATAs.

This unit has now expanded its business into Steam & Hydro Turbine spares with supply of all Parting Plane Fastners, Governing components, Guide Vanes etc. HERP is now the spares hub for all types of Mill spares, Turbine spares and Turbine Tools and Tackles.

This unit is located about 10 Kms. from the Varanasi railway station on the Varanasi-Lucknow highway and prides itself on its abundance of green cover throughout the plant and township area.

### **Corporate R & D**

BHEL's Corporate R&D Division at Vikasnagar in Hyderabad is the pivotal centre for all the research activities. In its progressive march aimed at realising the objectives advocated by the principles of BHEL's vision, mission and values. Corporate R&D is spearheading the R&D efforts by utilising the advanced laboratory facilities and the manpower of about 720 highly qualified and experienced engineers, scientists and supporting staff.

### **OBJECTIVES**

Corporate R&D is committed to achieve the following major objectives:

- Improvement in quality and performance of BHEL's products
- Generation of know-how through advanced basic and applied research investigations
- Development of new products and processes
- Development of life assessment and modernisation techniques for power and industrial equipment
- Exploring new and renewable energy sources
- Cost effective indigenisation
- Research in frontier areas of relevance to BHEL

### **MAJOR FACILITIES**

Corporate R&D houses state-of-art facilities to carry out its mission.

- Micro-alternator for turbo generator studies
- High voltage test equipment (upto 500 KV AC and 300 KV DC impulse)
- 800 kilojoules test facility for switchgear
- Electronic test instrumentation
- Control loop test facility

FT infra-red spectrophotometer  
High performance liquid chromatograph  
Closed circuit test facility for turbines  
Variable density and high-speed tunnels  
Thrust and journal bearing test rigs  
Laser torsional vibration monitor  
FM telemetry systems for rotor dynamics  
Vibration monitoring instrumentation  
Hydraulic servo-controlled (25 tonne, 100 tonne and 180 tonne) mechanical testing machines  
Advanced scanning electron microscope  
Creep and metal fatigue testing machines  
50 KN, 250 KN and 500 KN universal testing machine  
Stress-scan equipment for residual stress measurement  
Partial discharge-free 325 KV SF6 gas insulated test transformer  
Dust-free assembly room for gas insulated products  
Test rig for heat exchangers  
Fan test rig  
Test rig for studies on compressor diffusers  
Single and three phase automatic relay test system  
Multi-channel eddy current test system for in-situ inspection of condenser tubes  
X-ray diffraction systems  
High temperature furnaces for coatings and ceramics  
Environmental test facility for motorette testing  
Pressurised fluidised bed gasification and combustion test rigs for clean coal technologies.  
Stereo microscopes  
80 KW atmospheric plasma spray system  
HVOF coating facility  
Twin arc wire flame spray system  
5-Axis CNC machining centre  
Virtual Prototyping/Virtual Reality (VP/VR) Centre  
Centre of Excellence for Simulators  
Centre of Excellence for Computational Fluid Dynamics  
Centre of Excellence for Permanent Magnet Machines  
Centre of Excellence for Surface Engineering

## **RESEARCH ACTIVITIES**

### **ELECTRICAL**

Electrical Machines  
High Voltage Engineering  
Gas Insulated Products & Switchgear Development  
Insulation Technology

### **ELECTRONICS**

Power Electronics Systems  
Programmable Control Systems  
Applied Automation  
Power Plant Dynamics and Simulators

Transmission and Protection Systems  
Control and Instrumentation

## **MECHANICAL**

Turbomachinery  
Design Analysis  
Structural Dynamics  
Experimental Mechanics  
Machine Dynamics  
Heat Transfer  
Fracture Mechanics and Failure Analysis  
Computational Fluid Dynamics  
Special Projects  
Manufacturing Automation  
Advanced Material Handling Automation

## **CHEMICAL SCIENCES**

### **METALLURGY AND SURFACE COATINGS**

Metallurgy  
Surface Coatings and Treatment  
**COAL RESEARCH**  
**RENEWABLE ENERGY SOURCES**  
**FUTURISTIC RESEARCH**  
Fuel Cells  
Nano Technology and Smart Materials  
Superconducting Materials  
**SUPPORT SERVICES**  
**TECHNICAL SERVICES**  
Technical Information Centre  
Standardisation,  
Central Patents  
Technical Translation Groups

## **CONCLUSION**

Corporate R&D has developed more than 100 products and systems, most of which have been transferred to the company's manufacturing units for regular production. As recognition of these efforts, organisation has received many prestigious awards. Corporate R&D is today poised for meeting greater challenges and provide technological stimulus to the company in its pursuit of excellence.

## **(PS-PEM) Project Engineering Management**

Located at Noida is the design and Engineering group of BHEL Power Sector

### **Industry Sector, Delhi**

With a view to enhancing BHEL's capacity to offer integrated systems and to integrate under one umbrella the various products and systems in industry, transmission and transportations areas, Industry Sector(IS) was formed in June,1982 based on Business Sector concept.

In order to give a focused emphasis to customers in industry segments, where BHEL is a major contributor of equipment to industries like cement, fertilizers, refineries, petrochemicals, steel, paper etc., all business activities of BHEL were grouped under Industry sector and this sector was assigned the responsibility of offering a single-point contact for marketing of industrial products and services for industry, transmission and transportations areas.

Objectives and functions of Industry Sector are to develop marketing strategies and plans for future growth of business, to provide single point contact for marketing and sale of related products and services, to ensure co-ordination with the Government agencies and various decision-making bodies with reference to business in this sector.

### **International Operations Division, Delhi**

With a view to providing single-point contact and satisfaction to overseas customers, the idea of centralized export was implemented. The erstwhile activities of manufacturing units in the area of export were reorganized and brought under a single agency. Thus, Export Division was formed in 1975 under the Corporate roof. This division was renamed as International Operation Division after the restructuring based on Business sector concept in 1982. BHEL has, over the years, established its references in over 60 Countries of the world, ranging from United States in the west to New Zealand in the far East. These references encompass almost the entire products range of BHEL including turnkey power projects. This Division is headed by Executive Director(IO) and comprising of IO-Projects & IO-Marketing.