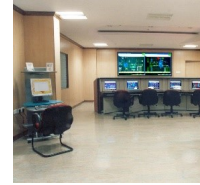


BHEL's centres of excellence

1. 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:

- Products: Operator Training Simulators (OTS), Compact Generator Simulator (CGS), Sequence of Events (SOE) Simulator and Performance Analysis, Diagnostics and Optimization (PADO) package
- Services: Dynamic Simulation Studies, Remote Monitoring and Diagnostic Service (RMDS) and training and development of New Control Logics



2. 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. The COE-CFD has made considerable progress in achieving technical capabilities in analysing complex problems, improving the performance of power plant equipment.

3. Centre of Excellence for Permanent Magnet Machines:

Centre of Excellence for Permanent Magnet Machines (COE-PMM) has established to develop in-house design and technology to manufacture permanent magnet machines with high-energy magnets for various applications. It meets the infrastructural needs for the development of complete range of special PMM using high-energy permanent magnets.



4. 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.

5. 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. Activities in the CIMAR focuses on implementation of computer integrated manufacturing (CIM), advanced radio frequency identification (RFID) technology for material identification and tracking, application specific robotic system development, 3D printing and paperless manufacturing and import substitution technologies development.



6. 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 (for generating dynamic characteristics), expert diagnostics and vibration monitoring systems, seal test rig, CAD workstations, etc.

7. 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.

8. 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. It is equipped with various state of the art instruments for nanomaterial synthesis and characterization.

9. 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.

10. 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 to develop technologies pertaining to HVDC, UHVAC up to 1200 kV, reactive power management, substation automation, Wide Area Protection (WAP), etc.



11. 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 productivity of fabrication shops and to enhance R&D capability through addition of state-of-the-art research facility. The facilities include friction stir welding system, CNC gantry welding system, laser hybrid pulsed SAW system, water jet cutting system, thermal cycle simulator, welding simulation facility.



12. 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. The major activities of the centre are generating and coal analysis data to BHEL's boiler design engineers, root cause analyses for over issues in coal based thermal power plants, analytical support for clean coal technology projects and establishment of a comprehensive coal databank for domestic and imported coals. The centre will also interaction with experts of national and international research centres and laboratories, training of manpower, conducting of workshops for acquiring and dissemination of advanced knowledge and skills.

13. 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 absorb technologies from collaborators, rationalise the hardware, understand and use latest simulation software in design of power electronics circuits, indigenisation of items, subsystems and systems of IGBT IGBT device characterisation, Type testing of equipment and functional testing requirements while executing commercial contracts. The major facilities include back-to-back testing of IGBT based evaluation facility, real time testing of power circuits/controllers using real time digital simulator (RTDS), IGBT tester, controller for locomotives and EMU system, EMI/ EMC testing for burst and surge test

14. 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 Bengaluru. The capabilities of the centre includes core developments in DCS hardware and software, development and testing of hardware, software, interfaces and systems, incremental development on hardware for modules for C&I, DCS in related area of power plant SCADA, simulating and troubleshooting facilities for site reported problems in DCS, security and maintenance of software and systems, and software.