केन्द्रीय विद्युत अनुसंधान संस्थान
CENTRAL POWER RESEARCH INSTITUTE
बेंगलूर
BANGALORE
स्थापित 1960 ESTD 1960

ANNUAL REPORT 2023-24

CENTRAL POWER RESEARCH INSTITUTE

GLOBAL CLIENTS OF CPRI

Countries Served

Bangladesh
Bahrain
Canada
China
Egypt
France
Germany
Ghana
Indonesia
Japan
Korea
Kuwait
Malaysia
Myanmar
New Zealand
Oman
Qatar
Russia
Sri Lanka
Singapore
Saudi Arabia
Syria
Spain
Sweden
Thailand
UK
USA, etc.

CENTRAL POWER RESEARCH INSTITUTE

Prof. Sir. C. V. Raman Road,
Sadashivanagar P.O., P. B. No. 8066,
Bengaluru – 560 080,
Karnataka, India

ANNUAL REPORT 2023-24

FOREWORD

It is with great pride that I present the Annual Report for the financial year 2023-24, reflecting the exceptional achievements and progress of the Central Power Research Institute (CPRI). As a premier national institution in the field of Power Engineering, our dedicated team of experts has worked relentlessly to foster innovation, translating research into practical solutions that contribute to the nation's energy infrastructure.

This year marked a significant milestone for CPRI, as we recorded an unprecedented revenue of Rs. 227.23 Cr. an all-time high since our inception. This achievement highlights our ongoing commitment to excellence and the value we deliver to our stakeholders.

Over the past six decades, CPRI has established itself as a leader in power equipment testing, offering a comprehensive range of services under one roof. Our seven state-of-the-art units across the country have positioned us to serve the entire power sector, including generation, transmission, and distribution.

In response to the nation's growing demand for testing and evaluation, CPRI is expanding its footprint by establishing new test centers at Nashik and Raipur, which will serve the electrical industry in the Western and Central regions. Additionally, CPRI is also in the process of establishing a Common Test Facility (CTF) at the Manufacturing Zone in Narmadapuram, Madhya Pradesh, under a pilot project led by the Ministry of Power and the Ministry of New and Renewable Energy (MNRE).

Furthermore, the capacity of our High Power Testing Facility in Bengaluru is being upgraded to 7500 MVA, enhancing our ability to meet the growing demands of the power sector.

During FY 2023-24, CPRI conducted 1,11,775 evaluations on 24,139 samples, providing services to 6644 clients. Our laboratories, accredited under ISO/IEC 17025, and our certification services, accredited under ISO/IEC 17065:2012, have enabled Indian manufacturers to export their products worldwide, contributing to the "Make in India, Make for the World" vision of the Government of India.

CPRI's global reputation is further strengthened by our membership in the Short-Circuit Testing Liaison (STL), providing internationally recognized testing services. We are committed to increasing the global acceptance of CPRI certifications, ensuring that products tested at CPRI continue to be trusted by utilities worldwide.

With the unwavering support of the Ministry of Power, Government of India, CPRI is continually advancing its testing facilities to address the evolving needs of the power sector. By prioritizing innovation, customer satisfaction, and quality, CPRI is well-positioned to meet future challenges, both domestically and internationally.

I extend my deepest appreciation to our esteemed customers for their trust and support. I also commend the entire CPRI team and their families for their dedication and contribution to our success.

Jai Hind!

(B A Sawale)

Director General

CONTENTS

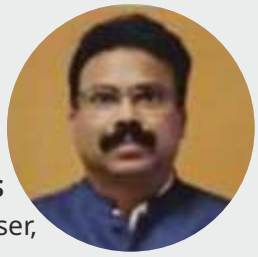
Governing Council
Central Power Research Institute
(Present Composition)

Shri Pankaj Agarwal, IAS
Secretary, Ministry of Power,
President, Governing Council

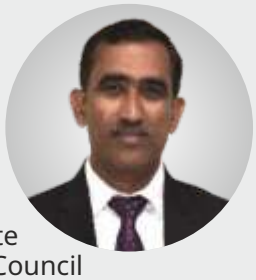
Shri Ghanshyam Prasad
Chairperson, CEA
Vice-President, Governing Council

Shri Srikant Nagulapalli, IAS
Additional Secretary
Ministry of Power
Member, Governing Council

Shri Piyush Singh, IAS
Joint Secretary
Ministry of Power
Member, Governing Council



Shri Mahabir Prasad, IRAS
Joint Secretary & Financial Adviser,
Ministry of Power
Member, Governing Council



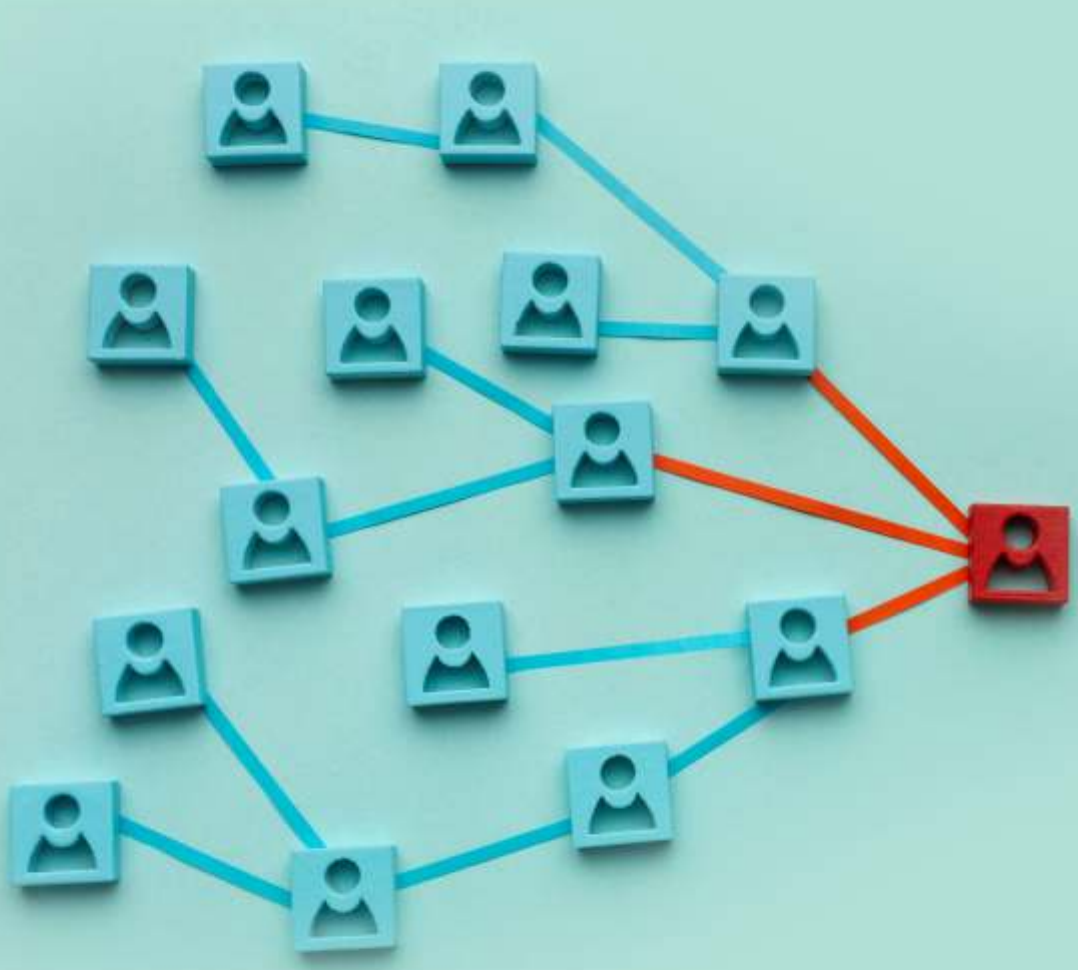
Shri B. A. Sawale
Director General
Central Power Research Institute
Member Secretary, Governing Council

MEMBERS OF CPRI GOVERNING COUNCIL

01	The Secretary to the Govt. of India, Ministry of Power	President
02	The Chairperson, Central Electricity Authority	Vice-President
03	The Additional Secretary, Ministry of Power	Member
04	The Economic Adviser, Ministry of Power	Member
05	The Joint Secretary & Financial Adviser, Ministry of Power	Member
06	The Member (Power System), Central Electricity Authority	Member
07	The Member (Planning), Central Electricity Authority	Member
08	The Secretary, DSIR, Ministry of Science & Technology	Member
09	The Secretary, Ministry of Commerce & Industry, Dept. of Industrial Policy & Promotion	Member
10	The Secretary, Ministry of New & Renewable Energy	Member
11	The Chairman & Managing Director, Bharat Heavy Electricals Ltd.	Member
12	The Chairman & Managing Director, NTPC Ltd.	Member
13	The Chairman & Managing Director, Power Grid Corporation of India Ltd.	Member
14	The President-IEEMA	Member
15	The Secretary, Central Board of Irrigation & Power	Member
16	The Managing Director, Bangalore Electricity Supply Company Limited (BESCOM)	Member
17	The Managing Director, Dakshin Haryana Bijli Vitran Nigam Ltd. (DHBVN)	Member
18	The Director, Indian Institute of Technology, New Delhi	Member
19	The Director, Indian Institute of Technology, Madras, Chennai	Member
20	The Director, Indian Institute of Technology, Guwahati	Member
21	The Director General, Bureau of Energy Efficiency	Member
22	The Director General, Central Power Research Institute	Member - Secretary

MEMBERS OF CPRI STANDING COMMITTEE

01	The Additional Secretary, Ministry of Power	Chairman
02	The Member (Power System), Central Electricity Authority	Member
03	The Economic Adviser, Ministry of Power	Member
04	The Joint Secretary & Financial Adviser, Ministry of Power	Member
05	The Director General, Central Power Research Institute	Member-Convener



SECTION - 1

ORGANIZATIONAL SET-UP

ORGANIZATIONAL SET-UP

CPRI – AN OVERVIEW

Central Power Research Institute (CPRI) was established by the Government of India in 1960, both in Bengaluru & Bhopal, with its Headquarters in Bengaluru. The Institute was re-organised into an autonomous society in the year 1978 under the aegis of the Dept. of Power, Ministry of Energy, Government of India. The main objectives of setting up the Institute were for it to function as a National Power Research Organization for undertaking applied research in electrical power engineering, to innovate and develop new products, besides functioning as an independent national testing and certification authority for electrical equipment and components to ensure reliability in the power system.

Objectives of CPRI

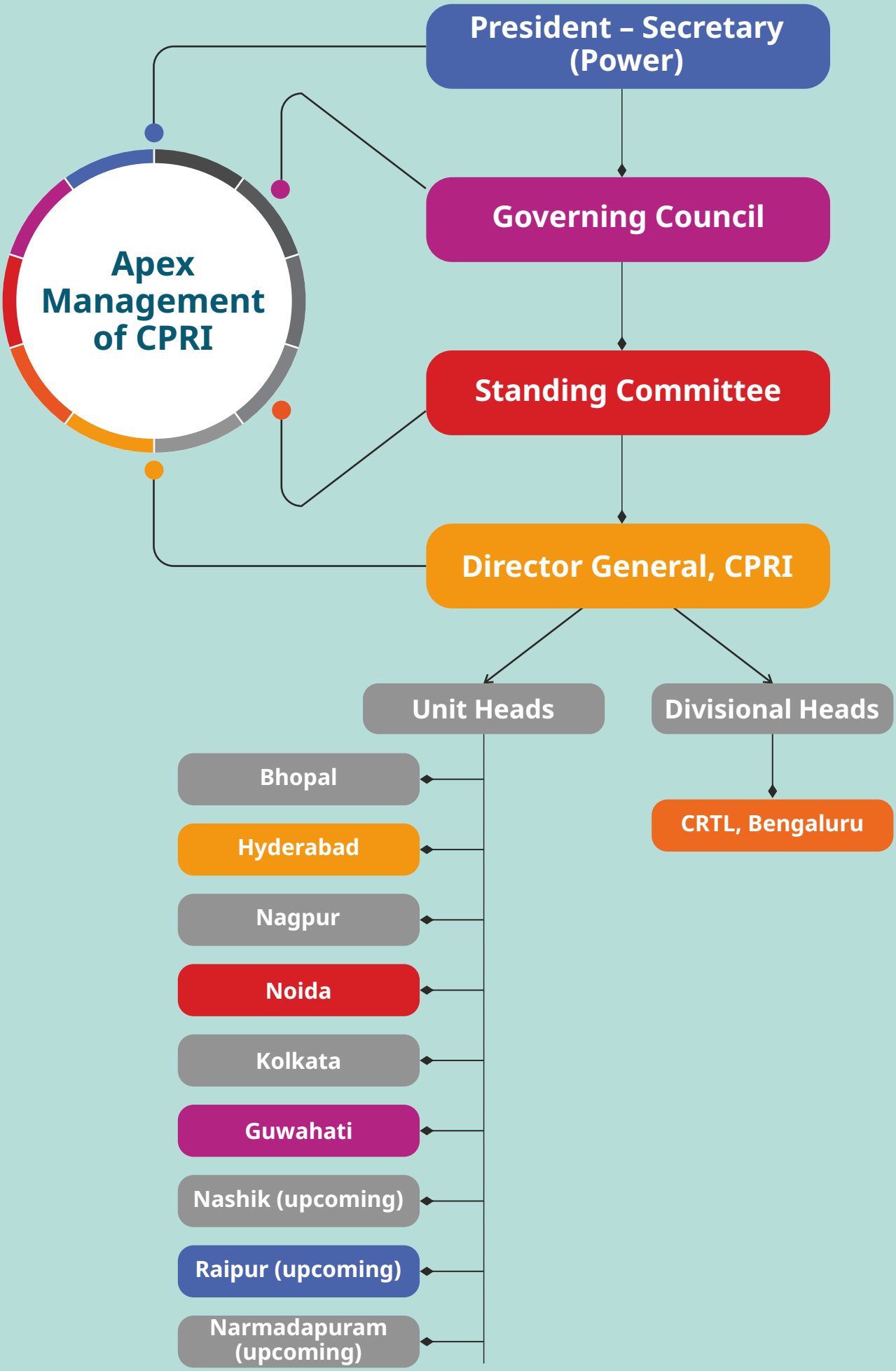
- Function as a National Power Research Organization for undertaking and / or sponsoring research and development projects in the fields of generation, transmission, distribution and operation of electricity supply systems.
- Provide necessary centralized research and testing facilities for evaluation of electrical materials and performance of power equipment.
- Serve as a National Testing and Certification Authority for the purpose of certification of rating and performance to ensure availability of equipment of adequate quality for use under conditions prevalent in Indian Power Systems.
- Act as an apex body for initiating and co-ordinating the R&D in the field of electric power.
- Evolve criteria for standards of various equipment for operation under Indian conditions and effectively participate in formulation of national standard specifications.
- Identify problems in the areas of basic and oriented basic research and arrange such studies in national academic Institutions.
- Co-ordinate R&D activities in the various State Electricity Boards and maintain liaison with other Institutions engaged in research connected with power systems and / or power equipment.
- Collect information and maintain documentation in the field of power engineering and prepare, print and publish technical paper, periodical or report in furtherance of the objects of the Society.
- Establish, maintain and manage laboratories, workshops and other facilities for furthering scientific and technological research and conduct experiments for exploiting the invention or discoveries to the cause of power development in the country.
- Enter into agreement with any enterprise or institutions or person or persons and provide funds to them to carry out research and development programme of the Society.

Management

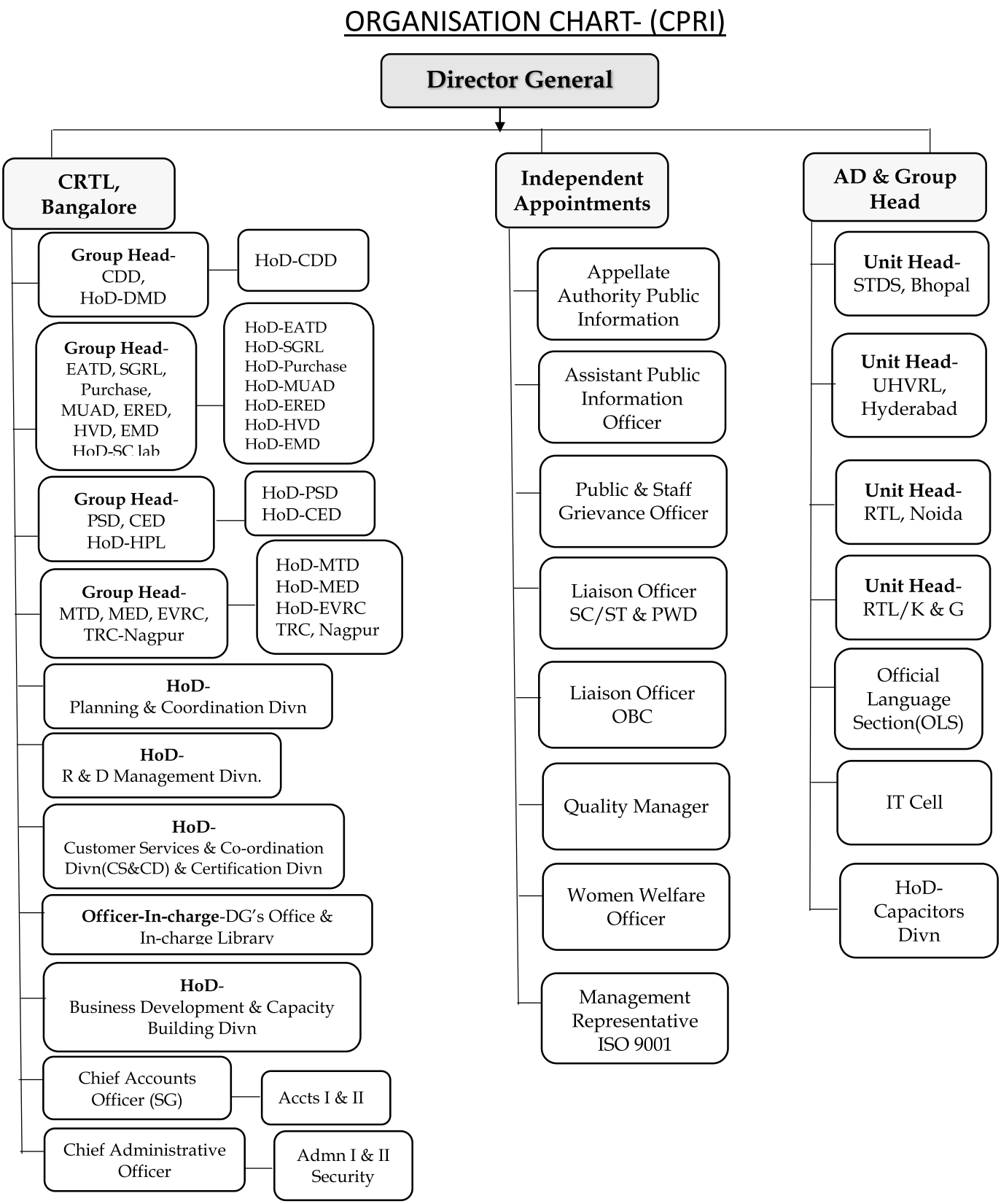
The management of the institute vests in its Governing Council comprising members representing different Utilities, Ministries of the Government of India, Central Electricity Authority, State Electricity Boards, Power Supply Utilities, Indian Electrical & Electronics Manufacturers' Association, and various other academic and R&D organizations of National importance in the field of electric power engineering. The Secretary, Ministry of Power & Chairman, Central Electricity Authority are the President and Vice-President of the Governing Council respectively, while the Director General of the institute is the Member-Secretary of the Governing Council.

A Standing Committee under the Chairmanship of Special Secretary/Additional Secretary, MoP with Member (Power Systems), Central Electricity Authority, Joint Secretary & Financial Adviser from the Ministry of Power and Joint Secretary looking after CPRI in MoP as Members and the Director General-CPRI as Member-Convener takes decisions on behalf of the Governing Council from time to time on administrative and financial matters.

The Committee on Testing & Certification takes decision on test tariff related activities. The Committee is chaired by Member (Power Systems), CEA.


Apex Management of CPRI
President – Secretary (Power)
Governing Council
Standing Committee
Director General, CPRI
Unit Heads
Divisional Heads
Bhopal
Hyderabad
Nagpur
Noida
Kolkata
Guwahati
Nashik (upcoming)
Raipur (upcoming)
Narmadapuram (upcoming)
CRTL, Bengaluru

Organizational Chart of CPRI as on 31st March 2024



Abbreviations ***CS&CD***-Customer Services & Co-ordination Divn, **CD**-Capacitors Divn, **CDD**-Cables & Diagnostics Divn, **DMD**-Dielectric Materials Divn, **EATD**-Electrical Appliances Technology Divn, **SGRL**-Smart Grid Research Laboratory, **MUAD**-Meter Utility Automation Divn, **ERED**-Energy Efficiency & Renewable Energy Divn, **HVD**- High Voltage Divn, **EMD**- Electrical Maintenance Divn, **PSD**- Power System Divn, **CED**- Civil Engineering Divn, **MTD**- Materials Technology Divn, **MED**-Mechanical Engg. Divn, **EVRC**- Earthquake Vibration Research Centre, **R&D M D**- Research & Development Management Divn, **OLS**- Official Language Section, **IT Cell**- Information Technology Cell, **STDS**-Switchgear Testing & Development Station, **UHVRL**-UHV Research Laboratory, **RTL**- Regional Testing Laboratory, **TRC**- Thermal Research Centre, **K & G**- Kolkata & Guwahati.

CPRI Head Office and its Units

Head Office:

1. **Central Research & Testing Laboratory (CRTL)**
   Prof. Sir. C. V. Raman Road,
   Sadashivanagar P.O, P. B. No. 8066,
   Bengaluru - 560 080, Karnataka

Units:

2. **Switchgear Testing & Development Station**
   Govindpura, Bhopal – 462023, Madhya Pradesh

3. **Ultra High Voltage Research Laboratory**
   Post Bag No. 9, Uppal P.O, Warangal Highway,
   Hyderabad – 500098, Telangana

4. **Thermal Research Centre**
   Dhuti, Wardha Road, Dongargaon,
   Nagpur - 441108, Maharashtra

5. **Regional Testing Laboratory**
   No. 3A, Sector - 62, Institutional Area,
   Noida - 201 309, Uttar Pradesh

6. **Regional Testing Laboratory**
   1st Floor, CTD Workshop, WBSEDCL,
   Abhikshan Building, BN Block, Sector - V,
   Salt Lake City, Kolkata - 700 091, West Bengal

7. **Regional Testing Laboratory**
   No.4, Type-III (Old A.T.)
   A.S.E.B. Colony, Forest Gate, Narangi,
   Guwahati – 781 026, Assam

Upcoming Units:

1. **Regional Testing Laboratory**

   Survey No. 220, Shilapur Village, Nashik Taluk,

   Maharashtra - 422003

2. **Regional Testing Laboratory**

   Village Banjari Layer 2,

   IIM Road, Atal Nagar,

   Nawa Raipur

   Chhattisgarh – 493 661

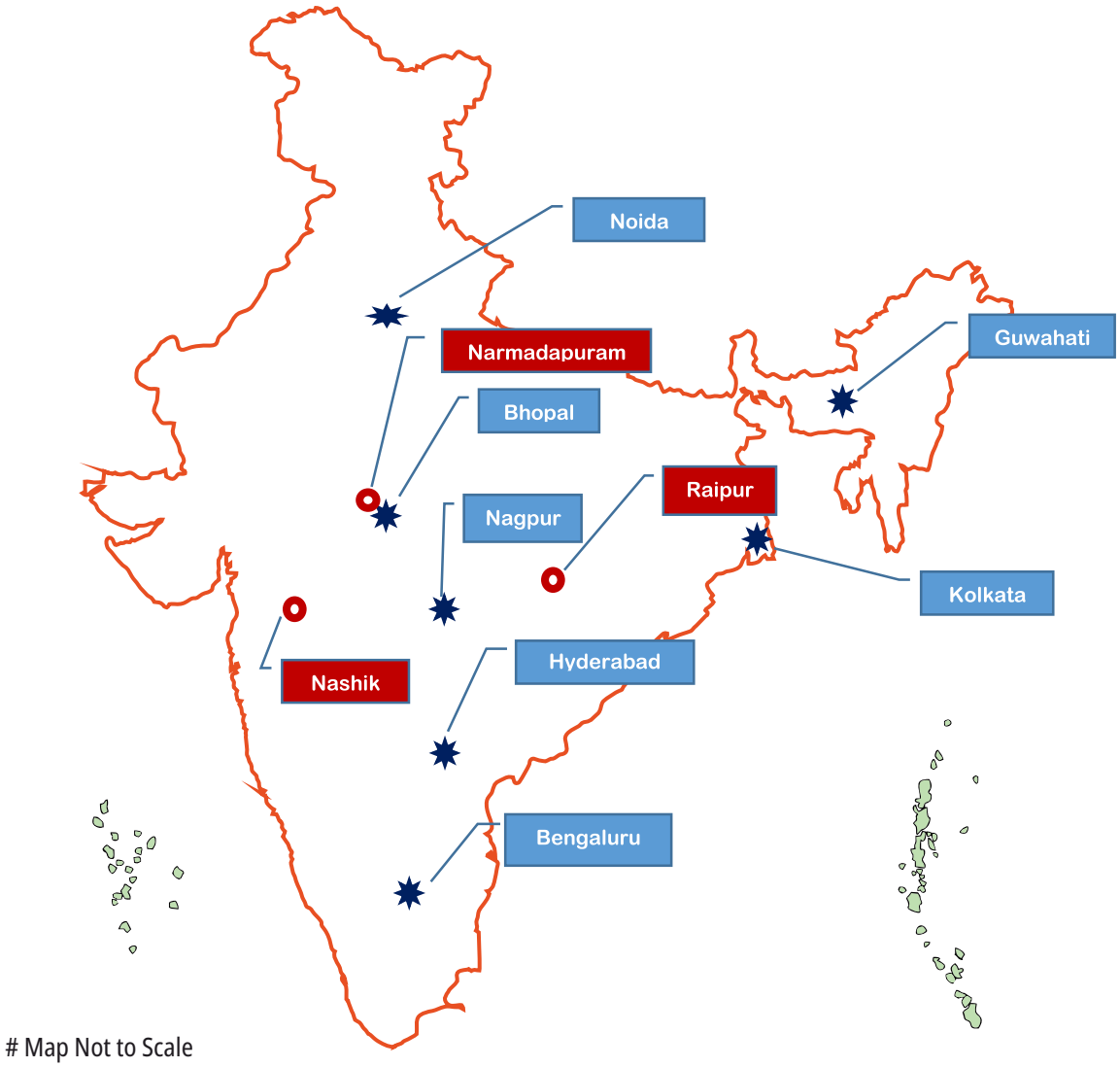
3. **Common Test Facility (CTF) at Manufacturing Zone**

   Mohasa Babai Industrial Area,

   Narmadapuram District,

   Madhya Pradesh

Units of CPRI



Map Not to Scale

		Existing Units of CPRI
01	✸	Central Research & Testing Laboratory, Bengaluru
02	✸	Switchgear Testing & Development Station, Bhopal
03	✸	Ultra High Voltage Research Laboratory, Hyderabad
04	✸	Thermal Research Centre, Nagpur
05	✸	Regional Testing Laboratory, Noida
06	✸	Regional Testing Laboratory, Kolkata
07	✸	Regional Testing Laboratory, Guwahati

		Upcoming Units of CPRI
01	●	Regional Testing Laboratory, Nashik
02	●	Regional Testing Laboratory, Raipur
03	●	Common Test Facility (CTF), Narmadapuram

Divisions under Central Research & Testing Laboratory (CRTL), Bengaluru

- Cables and Diagnostics Division (CDD)
- Capacitors Division (CD)
- Centre for Collaborative and Advanced Research (CCAR)
- Dielectric Materials Division (DMD)
- Earthquake Engineering & Vibration Research Centre (EVRC)
- Electrical Appliances Technology Division (EATD)
- Energy Efficiency and Renewable Energy Division (ERED)
- High Power Laboratory (HPL)
- High Voltage Division (HVD)
- Materials Technology Division (MTD)
- Mechanical Engineering Division (MED)
- Metering and Utility Automation Division (MUAD)
- Power System Division (PSD)
- Research & Development Management Division (R & DM)
- Short Circuit Laboratory (SCL)
- Smart Grid Research Laboratory (SGRL)

Central Research & Testing Laboratory (CRTL), Bengaluru

1. Cables & Diagnostics Division

The Division has facilities for type testing of all types of Power Cables of rating 1.1 kV up to 400 kV voltage and Power Cable accessories as per Indian and International standards. Cables laboratory has state-of-art facilities to take up prequalification test on Power Cables and accessories of rating up to 400 kV rating, for evaluation of EHV cable system for their long-term performance as per IEC 62067. In addition to electrical and physical test facilities the laboratory has test facilities for evaluating cables and materials for flame and smoke characteristics.

Power Cables Laboratory offers consultancy on:

- Failure analysis of Power Cables and accessories like Joints/Terminations
- Partial discharge measurements

Expertise is available for Diagnostic, RLA and LE (Remaining Life Assessment & Life Extension) studies on electrical equipment and for detailed investigations of specific problems related to Research and Development in these areas.

Diagnostics Laboratory has been rendering consultancy and field engineering services in the area of diagnostic testing of High Voltage substation and power plant electrical equipment. The Laboratory undertakes condition assessment of insulation system of the substation/ power plant electrical equipment.

EHV Cable Testing Bay

Insulation Division

The Insulation Division has specialized facilities and expertise for testing and evaluation of Dielectric materials, to carry out accelerated ageing and corrosion resistance studies on Dielectric materials.

Solid Dielectrics Laboratory has comprehensive, testing and evaluation facilities for solid insulating materials and systems. Insulating materials are evaluated and tested for electrical, mechanical, physical and electro-chemical properties. This laboratory has undertaken consultancy works and sponsored projects for many power utilities and industries. Assistance has been rendered to BIS, in formulation of various standards on enameled winding wires and insulating materials & systems.

Cyclic Corrosion Test Equipment

2. Capacitors Division

Power Capacitors Laboratory of CPRI, Bengaluru has established state-of-the-art facilities to cater to the test requirements of Capacitor Manufacturers within the country and abroad. Research, Testing and Evaluation of Power Capacitors which have applications as shunt capacitors, series capacitors, surge protection capacitors, motor capacitors, fan capacitors, fluorescent capacitors are carried out as per National and International Standards. Laboratory also has facilities for undertaking tests on filter reactors and series damping reactors associated with LV capacitors. The laboratory with the unique facilities is the first of its kind in this part of the world.

• Testing of LV APFC Panels

Tests on LV APFC panels are carried out as per IEC 61921 and IEC 61439. The temperature rise test is carried out on APFC panels with all capacitor units, detuned/damping reactors, if any, and other components connected. Temperature rise test can also be carried out at elevated ambient temperature of 55 °C.

• Environmental tests

Environmental tests are carried out on various electrical and non-electrical equipment / components / materials as per relevant standards.

• Research and Consultancy

The Division undertakes R&D in the following areas:

* Switching transients associated with capacitors.

* Investigation of PD Activity in Model Transformers.

The Division offers Consultancy and field engineering services for:

* Root cause analysis of premature failure of capacitors.

* Online partial discharge measurement on power transformers in services.

3. Centre for Collaborative & Advanced Research

Established in 2006, this Centre facilitates and promotes advanced research, thereby helping the power sector to derive the benefits of latest technology.

The main objectives of the Centre are to:

- Provide infrastructure for professionals to conduct research in power sector development.
- Create a conducive environment for collaborative research between R&D Institutions, Industry, and Academia
- Execute projects based on multi-disciplinary expertise drawn from different Institutions
- Foster healthy interaction and exchange of ideas between research organizations at a global level

4. Dielectric Materials Division

This Division has comprehensive evaluation facilities for insulating materials and composites. The insulating materials are evaluated and tested for electrical, mechanical, physical & electro- chemical and thermal properties. The Division has the following laboratories:

- Liquid Dielectrics Laboratory
- Polymer Laboratory
- Lubricating Oil Laboratory

The Division has developed several polymeric materials, namely epoxy novolok resin for insulators & electrical grade laminates and FRLS cables for critical safety applications. The Liquid Dielectric Laboratory has developed new extraction techniques for dissolved gas analysis. The Division has expertise in Furan analysis for interpreting the condition of solid insulation in transformers. It has also developed dielectric fluids based on Rapeseed oil. The Liquid Dielectric Laboratory has the complete facility for carrying out testing of Insulating oil, Natural Esters and Synthetic esters as per National/International standards.

The Lubricating Oil Laboratory has been set up to meet the quality assessment needs of industrial lubricating oils, turbine oils, etc.

Evaluation facilities like Cone Penetration, Drop Point, Oil Separation, Flash Point and Density are also available for Greases, Petroleum Jelly, Cable Filling & Flooding Compounds. Degree of Polymerization (DP) evaluation facility for solid insulation in Power Transformers is also available.

High Performance Liquid Chromatography - Furan Analysis

Head Space Gas Chromatograph System

5. Earthquake Engineering & Vibration Research Centre

This Centre is equipped with facilities for providing testing, research and consultancy services in the area of Seismic and Vibration qualification of a) instruments b) Equipment for nuclear power plants & other generating stations and c) Railways as per National and International standards. In addition, this Centre offers consultancy services in checking the design adequacy of Structures/Substations for earthquakes.

The Division is equipped with a Triaxial shake table of 3m x 3m size and 10 ton pay load capacity for simulating earthquake vibrations. In addition, the Division has Electrodynamic Shaker Systems for carrying out vibration tests on products and assemblies.

Servo Hydraulic Shaker System

6. Electrical Appliances Technology Division

The important activities of the Division include performance evaluation of low voltage electrical power equipment enclosures and other allied equipment, Fans, Refrigerators, Air-Conditioners & Batteries.

Balanced Ambient Calorimeter

The Laboratories under this Division are:

- Ingress Protection Laboratory
- Battery Testing Laboratory
- Fan Testing Laboratory
- Refrigerator and Air Conditioner Testing Laboratory

The Division offers check testing under the standards and labeling programme of the Bureau of Energy Efficiency.

Ingress Protection Test facility

7.Energy Efficiency & Renewable Energy Division

The Division undertakes research and testing activities in the field of renewable energy, efficient and effective utilization of energy.

Some of the Consultancy activities undertaken are in the area of energy audit, energy conservation and field engineering services of power plants. This division also provides Fuel Audit Study, Assessment and fixation of heat rate for regulatory bodies, Ex-bus capacity assessment of power plants and Technical minimum study.

The Division is accredited by Bureau of Energy Efficiency (BEE) for conducting Energy audit in thermal power plants, process industries, buildings and commercial establishments.

Grid Tied Inverter Lab

The Division has facilities for evaluating the following:

- Solar Photovoltaic modules
- Grid tied inverters
- LED & Photobiological tests
- Solar pumping systems
- Induction motors
- Exposure to Solar Radiation
- EV Chargers

8. High Power Laboratory

The High Power Laboratory at the Central Power Research Institute (CPRI) in Bangalore plays a crucial role in testing and evaluating electrical power equipment. Established in 1990, this facility specializes in high-power short circuit testing and is a part of CPRI's extensive network dedicated to power research and testing in India.

The laboratory is equipped with 2500MVA short Circuit Generator with advanced controls for Short Circuit Testing of wide range of Switchgear, power transformers and other equipment to evaluate their performance under fault conditions, adhering to national and international standards such as IS, IEC& IEEE.

The lab features high current transformer that can deliver up to 300 kA for one second, enabling the testing of bus ducts, disconnectors and other high voltage equipment

View of the Lab

2500 MVA Short Circuit Generator

9. High Voltage Division

The Division has facilities for dielectric testing of all major electrical equipment viz., Distribution Transformers, Power Transformers, Insulators, Potential Transformers, Air Break switches, Isolators, Cables, Bushings, Power Line Accessories, Lighting Arresters etc., up to 400 kV systems.

Impulse Voltage Generator of 3MV, 150kJ

The following Laboratories are under this Division:

- EHV Test Laboratory
- Pollution Laboratory
- Impulse Current Test Laboratory

This division has the facilities and expertise to carry out grounding studies for Generating Stations, EHV Substations and various industries. Pollution level measurements at sites enroute the transmission line are also carried out.

Lightning Impulse, Switching Impulse, RIV, Corona and Power Frequency Test Facility

10. Materials Technology Division

The Division is equipped with advanced and sophisticated materials evaluation facilities aimed at providing testing and consultancy services in the areas of materials engineering, Dynamic testing, wear and erosion resistant materials, electrical steels (CRGO and CRNGO), ceramic materials, failure & root cause analysis, coal and other fuels, industrial waste utilization, Nondestructive testing (NDT), and field engineering & consultancy services viz. condition assessment, Remaining Life Assessment (RLA), Renovation and Modernization (R&M) for power sector.

The laboratories under the Division are:

- Materials Engineering & Characterization and Analytical Laboratory
- Coal Testing & Analysis and Industrial waste utilization Laboratory
- Field Engineering Services & Consultancy Laboratory

Residual Stress Test – XRD based

Microwave Plasma Setup for Multi Fuel Gasification

11. Mechanical Engineering Division

The Division has unique facilities and expertise in testing and evaluation of transmission line towers and accessories like conductors, insulator strings, vibration dampers, and spacer dampers etc., up to 800 kV. It offers consultancy services for evolving optimized tower designs, up-grading/up- rating of existing transmission lines. Expertise is also available to investigate and offer specific R & D activities in these areas.

220kV Tower under Test

400kV D/C Tower Testing Facility

The Laboratories under the Division are:

- Tower Testing Station Laboratory (TTS)
- Structural Material Testing Laboratory (SMTL)
- Design / Consultancy services
- Vibration Laboratory

12. Metering & Utility Automation Division

This Division has facilities for Type Testing of electromechanical meters and electronic meter of accuracy class 0.2 to 2.0. By using latest versions of Conformance Test Tool – CTT and Functional Evaluation Tool – FET both Static Energy Meters and Smart Meters can be verified for their compliance respectively. Additionally, Communicability for Smart Meters can also be verified.

Energy Meter Testing

The following Laboratories are under this Division:

- Energy Meter Testing Laboratory
- Calibration Laboratory
- Metering Protocol Laboratory

13. Power Systems Division

This Division is involved in the power systems consulting services for Power Utilities and Industry. Services encompass a wide spectrum of Power system studies like Power systems Planning, Power systems Stability, Load Flow, Short Circuit Studies, Flexible alternating currents Transmission systems devices, High Voltage Direct current, Grid connectivity. Real time performance analysis of various types of controllers such as FACTS, HVDC, SVC and protection relays, Power systems protection & audit are undertaken.

Real Time Digital Simulator

Testing services include type testing of relays and phasor measurement units.

The Division has the following laboratories:

- Relay Testing Laboratory
- Phasor Measurement Unit Laboratory

PMU Calibrator

14. Research & Development

The CPRI plays a pivotal role in advancing research and development in the field of power generation, transmission, and distribution in India. With the State-of-the-art infrastructure, CPRI has been carrying out R&D projects that are crucial for addressing the pressing challenges faced by the Indian Power Sector. Focused on facilitating clean energy transition, CPRI's research contributions aim towards ensuring reliability, affordability, resilience, and access to energy for the masses. CPRI acts as a hub for fostering innovation by providing a platform for researchers in Academia, Utilities and Industry to explore and nurture their innovative ideas through the "R&D schemes of MoP being implemented through CPRI".

The R&D Management Division of CPRI co-ordinates the "R&D schemes of MoP being implemented through CPRI". Apart from managing the R&D schemes, CPRI also collaborates with Academia/Industry for joint Academic and Research Cooperation. CPRI has signed MoU with IIT Mandi and MANIT Bhopal in this regard during 2023-24.

CPRI is also the Mission Secretariat for the aspirational Mission on Advanced and High Impact Research (MAHIR) in Power Sector, a program that envisages end-to-end development of emerging and disruptive technologies for the Power Sector and implementing those in India. CPRI also coordinates and monitors the research required to support the Sustainable Agrarian Mission on use of Agri-Residue in Thermal Power Plants (SAMARTH) mission of MoP.

CPRI is also recognized as Research Centre by Visvesvaraya Technological University (VTU), Belgavi, Karnataka and Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur. The Research Centre promotes continuing education for officers, scientists, and engineers in the Indian Power Sector. The Centre offers Junior Research Fellowship (JRF) and Senior Research Fellowship (SRF) programs, leading to M.Sc.(Engg.) by Research and Ph.D.(Engg.) degrees in Electrical, Mechanical, Chemical Engineering, and Chemistry. The Research Centre also offers part-time registration for CPRI employees. Through this initiative, CPRI attracts talented students to contribute to ongoing research projects under its In-house R&D Scheme. The program helps in development of the highly skilled professionals for the Power Industry.

The CPRI has also established a Visiting Chair Professor position at the Indian Institute of Science (IISc), Bangalore. This endowed chair aims to bring eminent scientists and engineers in power engineering from around the world to IISc for collaborative research and teaching. These appointments facilitate research collaborations in new technologies for power systems and power electronics, benefiting both CPRI and IISc through the exchange of knowledge and expertise.

15. Short Circuit Laboratory

This Laboratory has facilities to undertake testing of electrical equipment like Distribution Transformers, Current Transformers, Potential Transformers, Low voltage switchgear and control gear equipment (MCB/MCCB/RCCB/ACB/ Fuses/Starter Modules etc.) and associated panel assemblies [LT Panels (PCC/MCC) / Distribution Boards / Feeder Pillars/ LV busways etc.], Power Cables and its accessories, Power connectors, Disconnectors, Load Break Switches, Earth Electrodes, HT Bus ducts, HT Panels etc. and many other related power system apparatus are evaluated.

50MVA Short Circuit Generator

Heat Run Test facility to carry out Temperature rise test upto 2.5MVA 33/22/11kV class Distribution Transformers, LV/HV Switchgear Equipment like LT Panels, Isolated Phase Bus-ducts, Isolators etc.

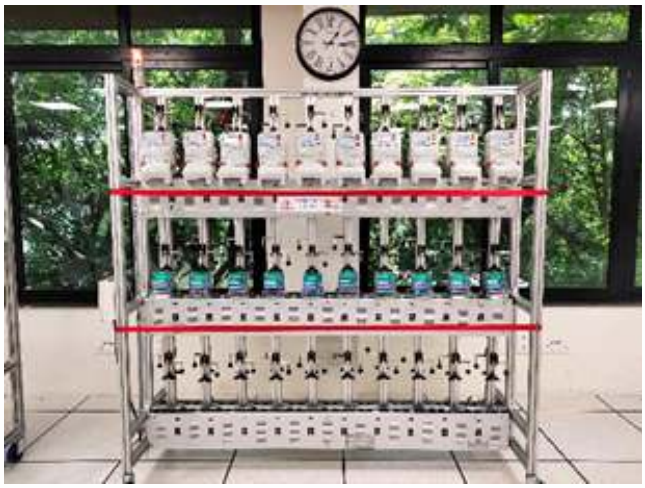
Test on LT Panel

16. Smart Grid Research Laboratory

The laboratory houses advanced facilities for carrying out testing and research in the area of Smart Grid which includes Advanced Distribution Automation, Advanced Metering Infrastructure, Interoperability, Communication and Cyber security systems. It includes Smart Grid Test Bed and Technology Demonstration Test Bed for AMI system. These test beds are also useful in performance evaluation of various smart grid components.

The Division provides testing of Communication Protocol and Security Conformance for Intelligent Electronic Devices (IEDs) / Gateways/ RTUs as per IEC 61850. The IEC test facility is accredited by UCA IUG as Level 'A'. The Division also provides testing of RTUs / FRTUs for communication protocol and security conformance as per IEC 60870-5-101 / 104 and IEC 62351.

Consultancy services for implementation of Smart Grid and AMI / smart meter implementation, Distribution Automation, SCADA System, substation automation systems, Cyber security and Communication Systems for various utilities, industries, and other organizations are also offered.



AMI System Testing

UNITS OF CPRI

1. Switchgear Testing & Development Station (STDS), Bhopal

This Unit has two main testing stations for conducting Short Circuit tests. They are:

STATION I:

Direct Short Circuit Testing Station of 1250 MVA capacity at 12kV capacity utilizing two specially designed 1500 MVA short circuit alternators, mainly caters to short circuit tests on high and Medium Voltage Switchgears, Transformers and other allied equipment.

1500MVA Short Circuit Alternator

STATION II:

The On-line Testing Station mainly caters to Short Circuit tests on Low Voltage Switchgears, Transformers and other allied equipment.

The Laboratory has Short circuit test facility for LT circuit breakers, contactors, Starters, Disconnector & switches & combination units, MCBs, MCCBs, RCCBs, RCBOs, Short circuit Dynamic and Thermal withstand test facility for Distribution Transformers.

Supplementary Test Laboratories:

Supplementary Test Laboratories consist of:

- High Voltage Lab
- Temperature Rise Test Lab
- CT and VT Test Lab
- Partial Discharge Lab
- Mechanical and Electrical Endurance Lab
- ACB, MCCB, MCB, RCCB, Contactors and Fuse Test Lab
- IP Test lab

2400kV Impulse Generator

25 kA Temperature Rise Test Bay

PD Test for Instrument Transformer, Bushing, Isolator etc.

Calibration Laboratory:

Calibration Services are offered in the area of Electro-technical & Thermal Discipline for various products/equipment. This Laboratory is accredited as per ISO/IEC 17025.

Energy Meter Testing Laboratory:

The laboratory has high precision state-of-art test facilities for all Type tests on Single phase, Three Phase Energy Meters, Transformer operated meters, Prepayment meters, Smart Meters, Data Exchange protocol, Smart meter communicability as per IS 15959 (Part 1, 2 and 3).

2. Ultra-High Voltage Research Laboratory (UHVRL), Hyderabad

UHV Research Laboratory, Hyderabad provides facilities for the development and testing of UHV Equipment (above 400 kV) and provides design data validation for various climatic zones, environmental and operating conditions of the Country.

View of the lab

Wet Impulse Test Facility

The Unit has following facilities:

Pollution Test Chamber

The Pollution Test Chamber is one of the largest in the world with a diameter of 24 m and a height of 27 m. Salt fog test can be conducted on insulators, bushings etc., up to 800 kV class.

Power Frequency Laboratory

The Cascade Transformer, comprising two units rated 800 kV each (total rating is 1600 kV, 9600 kVA) is used for energizing the experimental line, pollution chamber and testing equipment. The tests performed in this laboratory are dry and wet withstand test, flashover test, Radio interference voltage test, visible corona test, voltage distribution tests, Ferro resonance tests etc.

Impulse Generator

This Unit has the necessary infrastructure to simulate operating voltage conditions in the range

of 220 kV to 1200 kV on an experimental line. The facility can evaluate corona loss, audible noise, radio and television interference, electric field etc., under various voltage and climatic conditions. Besides, the Unit has the capability to investigate and evaluate equipment rated up to 1200 kV class.

DC Laboratory:

The ±1200 kV / 200 mA DC outdoor test system is a unique facility which is used for research on HVDC transmission as well as facilitating indigenous development & testing of equipment for the HVDC transmission lines in the country.

A View of ± 1200 kV DC Test System

Oil Testing Laboratory:

The laboratory has been established to carryout tests on Transformer Oil. The laboratory has facilities to carry out the tests on Transformer Oil as per IS 1866: 2017 and IEC 60422:2013.

UHV Indoor Shielded Laboratory

The Laboratory has a 1200kV, 2A, AC Test System with partial discharge test facility for Instrument Transformers, Bushings and other high voltage equipment. This laboratory caters to type tests on Current Transformers and Voltage Transformers.

800kV RIP Transformer Bushing under Partial Discharge test

3. Thermal Research Centre (TRC), Nagpur

This Centre is mainly intended for taking up consultancy and R&D work pertaining to Thermal Power Stations. The Centre carries out Condition assessment, Remaining Life Assessment, Renovation & Modernization, Life Extension studies and Non Destructive Evaluation (NDE) of Power Utilities and Industries equipment.

The equipment covered are Boilers, Turbines, Condensers etc.

Consultancy is also offered for Material characterization & failure analysis, Condition assessment of RCC and steel Structures etc.

RLA of Hydro Plant

4. Regional Testing Laboratory (RTL), Noida

Various Laboratories housed under this unit are:

- High Voltage Laboratory
- Cables Laboratory
- Oil Testing Laboratory
- Energy Meter Laboratory
- LED Lighting System

1000kV, 100kJ Impulse Voltage Generator

The important facilities under this Unit include testing of Cables up to 33kV rating, High Voltage facility for evaluation of Insulators, Transformers, Control Panels, CT, PT, CT-PT Unit, various types of bushings, Isolators, AB switch, Transformer Oil test facility for New and In-service Insulating oil of transformers, Energy Meter test facility for carrying out Type test, Acceptance test, Anti tamper feature verification and Protocol test for Static Meters and Smart Meters.

5.Regional Testing Laboratory Kolkata & Guwahati

These Laboratories were set up with a view to cater to the evaluation & certification needs of the electrical power equipment manufacturing companies, utilities and consumers in the eastern and north eastern region.

These Laboratories are equipped with facilities to carry out evaluation of insulating oil in Power Transformers. Dissolved gas analysis is carried out for assessing the internal condition of the Transformers. Furan Analysis using High Performance Liquid Chromatography (HPLC) is carried out for assessing the solid insulation condition of the transformers.

View of Unit - RTL, Kolkata

View of Unit - RTL, Guwahati

SECTION - 2

RESEARCH & DEVELOPMENT

RESEARCH & DEVELOPMENT

CPRI is the Coordinating Nodal Agency for the "R&D schemes of the Ministry of Power (MoP) being implemented through CPRI" with details as given below:

(i.) In-House Research Projects (IHRD)

(ii.) Research Scheme on Power (RSoP) Projects

(iii.) R&D Under National Perspective Plan (NPP)

a. Projects coordinated by CPRI

b. Projects under Uchhatar Avishkar Yojana (UAY)

c. Projects under Impacting Research Innovation and Technology (IMPRINT-I)

Procedure for screening, review and approval of Project Proposals: CPRI has a comprehensive review and approval mechanism of the proposals received under the R&D Schemes. The proposals are first checked by the R&D Management Division for consistency of information and examined whether the research intent is in line with the Thrust Areas identified in the National Electricity Plan. The proposals are then sent to two domain experts for review of the research content and to evaluate the technical feasibility. Based on the comments, the proposals are put up to a Technical Committee (TC) for recommendation. At present there are four TCs viz. TC on "Hydro", TC on "Thermal", TC on "Transmission" and TC on "Grid Distribution & Energy Conservation" Research. The TCs are chaired by eminent Professors from IITs. The proposals recommended by the TC are put up for consideration of D.G., CPRI/the Standing Committee on Research and Development (SCRD). The SCRD is chaired by Chairperson, Central Electricity Authority, New Delhi and has representations from MoP, Academia, Industry, other Ministries. The representation of other Ministries in the SCRD ensures that overlapping of research under the proposed scheme can be avoided.

The Apex Committee of IMPRINT-I chaired by Secretary (Higher Education), Ministry of Education (MoE) and with members from the participating Ministries has been constituted for approval of the proposals and monitoring the progress of implementation. The Apex Committee has the authority for financial sanction and financial closure of the projects. The National Co-ordinator for IMPRINT-I viz. IIT, Kanpur is responsible for convening the Apex Committee meetings.

IIT-Madras is the National Co-ordinator for implementation of the UAY scheme. Monitoring of the progress of projects under the UAY Scheme is done by an inter-ministerial committee constituted for this purpose.

Administering of R&D Projects

The Apex Committee on R&D namely Standing Committee on R&D (SCRD) is headed by Chairperson, CEA. The Standing Committee on R&D (SCRD) is the apex body that evaluates the research projects and also monitors implementation of the scheme objectives.

Four Technical Committees have been duly constituted to administer the R&D Projects in the areas of Thermal, Hydro, Transmission, Grid, Distribution and Energy Conservation. The four Technical Committees assist SCRD by closely monitoring and steering the projects to successful completion.

Funding Mechanism:

Projects approved under the RSoP and IHRD schemes are fully funded by the MoP. However, in case of projects taken up by the Industries under the R&D under NPP Scheme, the project cost is shared by the concerned Industry and the MoP on 50:50 basis.

For projects approved under the UAY Scheme, half of the project cost is funded by the MoE, 25 % is borne by the MoP and the remaining 25% by Industry.

For Projects approved under 'Energy' domain of IMPRINT-I Scheme, the cost of funding the projects is shared equally between the MoE and the MoP. Thus, funding support to the extent of 50% is extended by the MoP.

Project monitoring:

Quarterly Progress Reports and Utilization Certificates are submitted by the project implementing organization to the R&D Management Division of CPRI. Further, the Four

Technical Committees and the SCRD monitor the progress of the on-going projects.

During the 12th Five Year Plan and the subsequent three year action plan period, CPRI has funded 25 projects under the "R&D under NPP" scheme, 63 projects under RSoP scheme and 38 projects under IHRD Scheme. Some of the projects aim at design and development of indigenous technologies with the objective of cost reduction, import substitution and employment generation. The deliverables of the projects help in development of innovative solutions thereby adding to the knowledge capital on the particular priority area and also acts as prior art for the future research.

In-House Research Projects (IHRD)

In-house research projects serve to develop technology and expertise to cater to the future needs of the Indian power industry. These projects are proposed by officials of CPRI after careful analysis of the current technological requirements and conditions prevailing in the Indian Power Sector. The projects proposed are recommended by the Technical Committee on Transmission, Grid, Distribution and Energy Conservation, Hydro and Thermal Research and then approved by Standing Committee on R&D (SCRD).

Under IHRD, CPRI is engaged in research and development activities that enhance the efficiency and reliability of the power sector. The projects cover diverse domains such as power system analysis, power quality, high voltage engineering, and renewable energy integration. Some of the projects include developing high-efficiency insulating materials, enhancing thermal conductivity for ceramic insulators, design of run of the river hydro power plants etc. CPRI has also undertaken projects on designing dynamic protection schemes for utility-scale electric vehicle charging and developing high-energy density composite materials for fast-charging lithium-ion batteries. CPRI is also working on seismic qualification of instrument transformers, designing advanced transmission line towers, and assessing transformer inrush withstand capabilities.

Research Scheme on Power (RSoP) Projects

The project proposals are invited from Academia, Power Utilities, and Research Institutes. The projects proposed by the Scientists and Engineers are recommended by the Technical Committee on Transmission, Grid, Distribution and Energy Conservation, Hydro and Thermal Research and then approved by Standing Committee on R&D (SCRD), for projects above Rs. 50 Lakhs and by Director General, CPRI for projects with outlay upto Rs. 50 Lakhs.

The RSoP scheme supports a spectrum of projects with a variety of novel ideas. These projects include the use of Computer Vision for optimizing boiler combustion, modular low-temperature ORC units for localized electricity generation, and advanced coatings for thermal power plant components and robots for inspecting boiler tubes. Innovations also include enhanced transmission line performance studies, and cyber-security measures for power networks. The projects are also looking into improving renewable energy integration, development of metal nanocomposites for solar cells, sodium-ion batteries, grid-independent radiant air-conditioning systems, and energy blockchain implementation. Additionally, projects focus on transformer monitoring, electric vehicle charging infrastructure, and recycling of PV modules.

National Perspective Plan (NPP) Projects

The project proposals are invited from Academia, Power Utilities, Electrical Equipment manufacturing companies and Research Institutes. The proposals are recommended by Technical Committees (Transmission, Grid, Distribution & Energy Conservation, Hydro and Thermal Research) and approved by Standing Committee on R&D chaired by the Chairperson, CEA, New Delhi.

Under the NPP scheme, supported projects include research under the SAMARTH mission for co-firing biomass in thermal power plants. Under the SAMARTH mission, CPRI is evaluating various coal and biomass blends, including raw biomass like coffee husk and groundnut shell, to facilitate co-firing in thermal power plants. This research also involves studying combustion kinetics and corrosion simulation of boiler tube coatings to optimize the efficiency and sustainability of biomass co-firing.

Indigenous development and demonstration projects are a primary focus under NPP and projects like the use of drone swarms for monitoring power

substations and the demonstration of a centralized protection and monitoring system within a substation are under execution through the scheme. The scheme has also supported development of Large Eddy Simulations techniques to investigate flow instabilities in hydraulic turbines operating off-design which is of great help for Hydro Power Utilities. Under one of the projects advanced multifunctional asbestos-free thermal insulating materials has been developed and currently discussions are going on with various industries for commercialization.

3 YEAR ACTION PLAN PROPOSALS

"R&D Schemes of Ministry of Power being implemented through CPRI" with an outlay of Rs.90.8284 crore was approved on 20th August 2018, comprising of In house Research Schemes of CPRI (IHRD), Research Scheme on Power (RSoP) and R&D under National Perspective Plan (NPP).

During the FY 2023-24

No. of Patents Granted	16
No. of Copyrights filed	2
No. of IHRD projects completed	3
No. of RSoP projects completed	16

The following projects pertaining to some of the thrust areas of research have been completed during the year:

Photovoltaic (PV) and Renewable Energy

Sl. No.	Title	Project Implementing Division/ Organization
1.	New generation Ethylene Vinyl Acetate (EVA) nano-composites with high UV shielding properties for Photovoltaic Modules	INS (CDD), CPRI
2.	Investigations on Control Flexibilities of Grid Integrated Solar Photo Voltaic Energy Conversion System	NIT Warangal
3.	Transmission Line Protection in the Presence of Bulk Solar Photo Voltaic Power Plants	IIT Kharagpur

Smart Grids and Cyber-security

Sl. No.	Title	Project Implementing Division/ Organization
1.	Development and Validation of Security Solutions against Various Cyber Attacks at Substation/Transmission Level for Indian Power Grid Network	IIT Roorkee
2.	Cyber Physical Modelling and Detection of Cyber Attacks in a Wide Area Damping Controller (WADC) for Smart Grids	IIT Tirupati
3.	Study on Detection of False Data Injection (FDI) Attacks in Smart Grid Cyber-Physical Systems: A Machine Learning Approach	IIT Ropar
4.	Agnostic strategies for cyber–physical attacks quantification and mitigation in power networks	IIT Kanpur
5.	Development of a real-time cyber-attack detection module and its hardware-in-loop testing for an integrated power network	IIT BHU

Grid Integration, Simulation and Control

Sl. No.	Title	Project Implementing Division/ Organization
1.	Design and Development of Improved Control Techniques for Unified Power Quality Conditioner with Distributed Generation (UPQC-DG)	BITS-Pilani
2.	Design, operation, and control of distributed generation (DG) integrated unified power quality conditioner (UPQC) in electric grid	IIT Guwahati
3.	Design & Development of a Cost-effective & Energy-efficient Grid-connected Pumped Hydro System employed with Sensor-less PMBLDCM	NIT Meghalaya
4.	The unsteady aerodynamic response in LP turbine blade and its control under part load conditions	IIT Roorkee

Novel Materials for Power Sector Applications

Sl. No.	Title	Project Implementing Division/ Organization
1.	Development of vegetable ester-based nanofluids for transformers	DMD, CPRI
2.	Development of polymeric films for high energy density capacitors application	DMD, CPRI
3.	Development of nanocrystalline materials for solid oxide fuel cells working at 600°C	Karunya University, Coimbatore

Power Electronics and Sensor Technologies

Sl. No.	Title	Project Implementing Division/ Organization
1.	Design and Development of RF sensors for identification and localization of incipient discharges in GIS	IIT Madras

Electricity based Cooking technologies

Sl. No.	Title	Project Implementing Division/ Organization
1.	Development of Electricity Based Clean and Efficient Cooking Technology Suitable for Indian Cookware	IIT Kharagpur
2.	Design and Development of Efficient Induction Cooker suitable for Vessels of Different Material	NIT Warangal

Transmission Line Towers

Sl. No.	Title	Project Implementing Division/ Organization
1.	Analysis of Performance of Inclined Plate Anchors Embedded in Geosynthetics Reinforced Soils for Transmission Tower Foundations	IISc, Bangalore

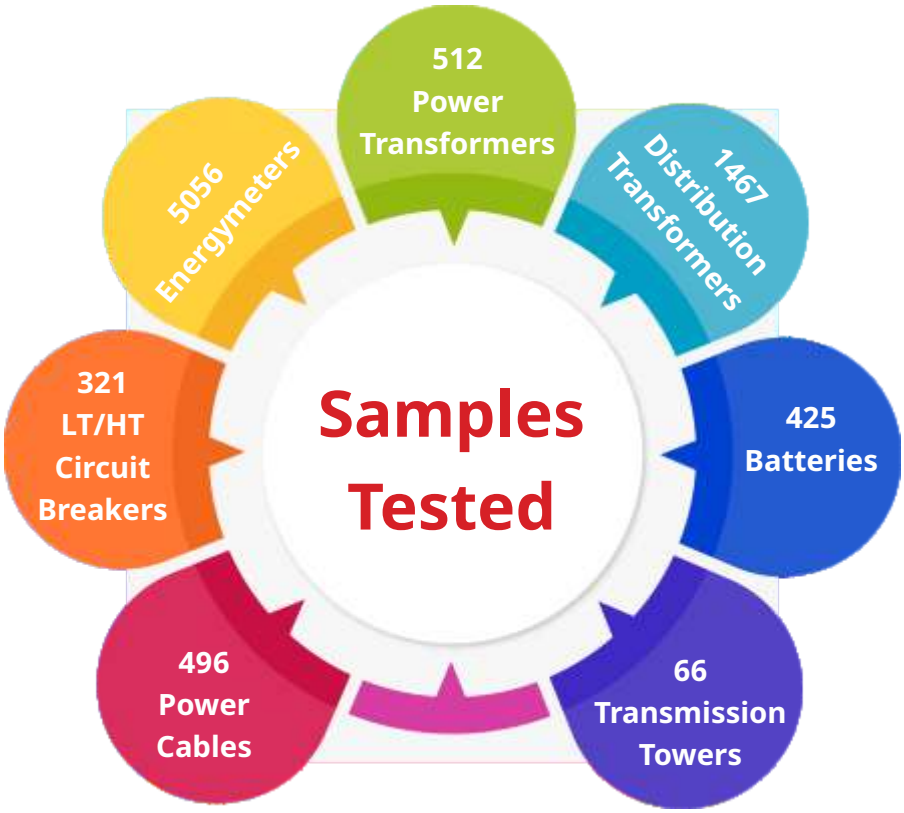
SECTION - 3

EVALUATION & CERTIFICATION

Products Tested at CPRI

Power Transformers	Voltage Transformers	Busducts	Energymeters
Power Cables	Circuit Breakers	Capacitors	Inverters
Current Transformer	Distribution Transformers	Insulators	Transformer Oil
LT, HT Panels	Conductors	Towers	LEDs Batteries

Total Reports issued	9593



EVALUATION & CERTIFICATION

For the past six decades, the Institute has been serving the Power Sector in the field of evaluation and certification. CPRI is a Member of prestigious Short Circuit Testing Liaison (STL) (Forum of World's 11 largest laboratories) and the Laboratories of CPRI are accredited by NABL and NABCB as per IEC/ISO 17025:2017 and ISO/IEC 17065:2012 respectively. The Consultancy Services are certified as per ISO 9001:2015.

During the year 2023-24, a total of 1,11,775 tests were conducted on 24,139 samples for 6644 clients which includes Central, State & Private Power Utilities, domestic and international manufacturers.

CPRI's Contributions in the Formulation of Standards

CPRI has made significant contributions to the development and upgrading of standards at both national and international levels, particularly through its active participation in bodies such as the Bureau of Indian Standards (BIS) and the International Electrotechnical Committee (IEC).

National Contributions:

CPRI is well-represented in BIS across various technical committees related to electrotechnical, chemical, and mechanical disciplines.

- Leadership Roles: Four officers from CPRI hold Chair positions.
- Principal Members: Fifteen officers serve as Principal Members.
- Committee Members: Thirty-five officers contribute as members of different BIS committees.

International Contributions:

CPRI's presence extends to the IEC, where nine of its officers actively participate in various technical committees, contributing to the development of international standards.

IEC Award

Notably, CPRI's Director General received the prestigious IEC 1906 Award 2023 for expert contributions to the IEC TC 13 Committee.

BIS Accreditation for CPRI, RTL-Noida

Regional Testing Laboratory (RTL), Noida was awarded with BIS Accreditation for Static and Smart Meters, Distribution Transformers and Cable Testing during the year 2023-24.

First – time Tests & Special Tests

- **Over Voltage test on 200kVAR, 7.96kV – 3 Nos. HV Capacitors**

200kVAR, 7.96kV – 3 Nos. HV Capacitors were tested for Over Voltage Cycling test at -40°C, as per IEEE-Std.18-2012 for the first time in CPRI.

Arrangement for Over Voltage Test on 200kVAR, 7.96kV, Internal HV Capacitor

- **3 Phase Capacitors of rating 4.434 kV, 630 kVAR, 3 x 85 MFD and 3.515kV, 372.625kVAR, 3 x 88 MFD**

3 Phase Capacitors of rating 4.434kV, 630kVAR, 3 x 85 MFD and 3.515kV, 372.625kVAR, 3 x 88 MFD were tested as per IEC 60871-1 & customer requirements for the first time for Thermal Stability Test and Ageing test.

Arrangement for Thermal Stability Test on 4.434kV 630kVAR, 3 x 85 MFD Capacitor

- **Compact APFC Panels of various ratings upto 550kVAR**

Compact APFC Panels of rating upto 550 kVAR were tested for Temperature rise test, Dielectric tests as per IEC 61921-2017 & customer requirements at 50°C for the first time. Power Capacitors Laboratory of CPRI is the only facility for this test in the country.

Compact APFC Panel of rating 550kVAR, 440V, 3 Phase, 50 Hz

- **Environmental Test on GIS Switchgear Equipment**

Environmental Simulation test for Dry Heat and Damp Heat test on GIS Switchgear Control Cubicles as per customer requirements was carried out for the first time.

Environmental Simulation test for Dry Heat and Damp Heat test on GIS Switchgear Control Cubicles

- Type test on 1X2500 Sq.mm, Copper Conductor, XLPE insulated, Lead Sheathed, Copper wire screened, HDPE sheathed 400 kV Cable with two outdoor terminations (One Porcelain & One Polymeric), one insulated joint and back to back SF6 terminations were conducted as per IEC 62067-2022.

Type test on 1X2500 Sq.mm, 400 kV XLPE Cable System

- CDD has successfully carried out Pre-Qualification Test on 220 kV Cable accessories comprising of fluid filled Composite Insulator terminations, GIS/Transformer terminations one Straight through joint and two shield break joints mounted on 220 kV, 2500 Sq.mm, XLPE Cable as per IEC: 62067- 2022.

Pre-Qualification test arrangement - Fixing of terminations & laying of Cables with GIS Accessories for 220 kV Cable System

- Battery Pack Capacity Test (217.6Volts, 144AH, 17Modules of 12.8Volts, Charging Voltage: 248.2Volts, Max. Discharge Current 60Amps, Energy:31.33KWh, Built-in Battery Management System, Lithium Ion Phosphate Battery)

Battery Pack Capacity Test

- Complete Electrical Safety including general safety, standard protections, mechanical safety, digital communication tests, harmonics and Environmental tests as per IS 17017 (Part 1): 2018 and IEC 61851-1 standard on AC EV Charger. Also, EMI/EMC Testing (Conduction Emission, Harmonics, Surge and Flicker) on AC and DC EV Chargers as per CISPR, IEC 61000 series etc., were conducted.
- Digital Communication testing as per IEC 61851-24 standard (Charin Test Cases) for CCS Protocol on 30kW DC EV Charger.
- Conduction Emission as per IS/CISPR 32 standard for 3.7kW (5HP) Solar VFD and Safe Torque Off (STO) test on 3.7 kW (5HP) Solar VFD as per IS/IEC 61800-5-2 standard. Harmonics and voltage flicker tests were carried out in the Division/Lab for the first time for a Variable Frequency Drive (VFD).
- Two samples of Photobiological hazard test on the "Virus Attenuation Device" as per IS 16108/ IEC 62471 standard.
- A test on the 7.6kW, 60Hz Solar-Battery Hybrid Inverter for Inrush current and Load step.
- Performance testing of 100kW Harmonic Generator based on Si-C Technology.
- Seismic test on 800 kV, 2500 A Condenser Bushing, Conservator Assembly for offshore application and 420 kV Single Pole, SF6 Circuit Breaker were carried out.

Seismic test on 800 kV, 2500 A Condenser Bushing

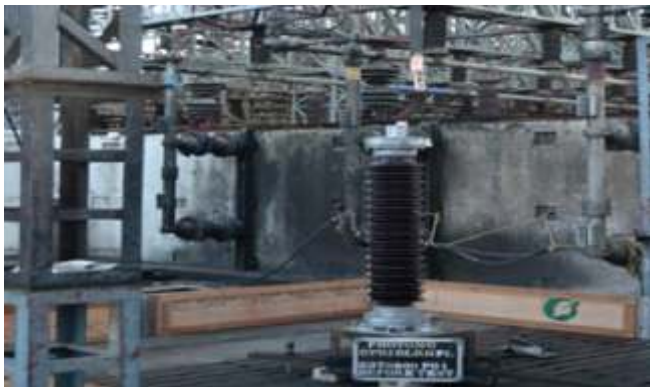
Seismic test and Vibration test on Conservator Assembly for offshore application

Seismic Test on 420 kV Single Pole SF6 Circuit Breaker

- Short Circuit test duties on 36kV, 31.5kA Three Phase Circuit Breaker by single phase method was conducted at HPL, CPRI, Bengaluru for the first time in India.

Short Circuit test duties on 36kV, 31.5kA Three Phase Circuit Breaker by single phase method

- Short Circuit test on 120kV Porcelain Surge Arrester for 50kA was conducted at HPL, CPRI, Bengaluru for the first time in India.



Short Circuit test on 120kV Porcelain Surge Arrester for 50kA

- 72.5kV, Co-axial type disconnector was tested at 130kArms for one second with a peak of 325kA. This type of product is tested for the first time in India, which is an import substitute.

72.5kV, Co-axial type disconnector tested at 130kArms for one second with a peak of 325kA

- Short Circuit making test on 36kV, 31.5kA Three Phase Earth Switch by alternative test method was carried out at HPL, CPRI, Bengaluru for the first time in India.

Short Circuit making test on 36kV, 31.5kA Three Phase Earth Switch by alternative test method

- Bias Test on 420kV GIS Isolator.

Bias Test on 420kV GIS Isolator

- Reinforced Cement Concrete (RCC) Earthing Block, made for earthing purposes only for underwater (Backwaters & Dams) earthing system was tested for short-time withstand current and peak withstand current tests at 25kA rms for 1 second with a peak of 52.5kA. This type of Earthing Block used for marine earthing system was tested for the first time at Short Circuit Laboratory.

Short-time withstand current and peak withstand current tests on RCC Earthing Block

- Temperature Rise Test on 18 MVA, 33/0.69-0.69-0.69-0.69kV, Five Winding Aluminum Wound, Inverter duty Transformer was conducted for the first time in Supplementary Test Laboratory, STDS, Bhopal. It is used for solar Plant.

18 MVA, 33/0.69-0.69-0.69-0.69kV, Five Winding Aluminum Wound, Inverter duty Transformer

- High and Low Current Short circuit test on 66/72.5 kV, 10kA, 40kA, Metal Oxide Gapless Lightning Arrester.
- Verification of short circuit withstand strength test on 1000V, 5000Amps, 120kA, 1s, Sandwich Insulated Bus Trunking System/Rising mains.
- Ability to withstand the dynamic effects of short circuit test on 6000 kVA, 20/0.620 kV, 3 Phase, Dry Type Transformer with Enclosure.
- Short time current test on 16kV, 12500A, 120kA, 1s, IP Busduct.
- Terminal fault test duties and combined single capacitor bank cable charging and line charging current switching test [Class C2] on 12kV, 1250A, 26.3kA Indoor VCB Panel.
- Ability to withstand the dynamic effects of Short circuit on 18000 kVA, 33/(0.690-0.690-0.690-0.690) kV, Inverter Duty Transformer.
- Artificial DC Salt Fog Pollution test by solid layer method on ± 500 kV HVDC, 210 KN, Composite Silicone Long Rod Quadruple Tension String consisting with hardware fittings suitable for ACSR Quadruple Lapwing Conductor.

New Test Facilities Created

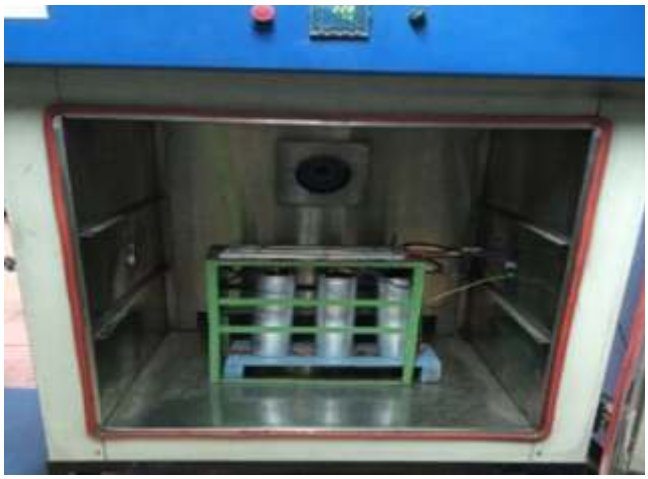
Regional Testing Laboratory (RTL), Noida

Furan Analysis, PCB & DBDS Content for New & In-service Insulating oil as per IS 1866:2017/IEC 60422 and IS: 335:2018/IEC 60296

Testing & Certification for Overseas Customers

Capacitors Division (CD)

Testing and evaluation of 30kVAR, 440V LV Shunt Capacitor as per IEC 60831-1-2014 for M/s. Electrical Components (ELCO), Malaysia.



Thermal Stability test on 30kVAR, 525V, 3 Phase, Self-Healing type LV Shunt Capacitor

Cables & Diagnostics Division (CDD)

- Type test on 2CX 25 Sq.mm, AL/XLPE/SWA/PVC 0.6/1 kV Cable as per IEC 60502-1/2001 for M/s. National Cable Industry, Sharjah, UAE.
- Type test on Heat Shrinkable Outdoor / Indoor Terminations mounted on 3X150 Sq.mm, 18/30 (36) kV XLPE Cables as per IEC 60502-4/2010 for M/s. Giza Cable Accessories, Egypt.
- Type test on 1 X 2500 Sq.mm, Copper Conductor, XLPE insulated 220 kV Cables as per IS 7098 Part-3 for M/s. Phelps Dodge International Thailand Limited, Thailand.
- Circuit Integrity test (Fire Alone test) on 2X1.5 Sq.mm and 2X2.5 Sq.mm 300/500 V, Fire Alarm Shield Cables as per IEC 60331-11-21 for M/s. Partex Cables Limited, Bangladesh.
- Fire alone Circuit Integrity test on 2CX1.5 Sq.mm, 300/500 V, FR Insulated, FR Sheathed, Fire Alarm Shielded Cable With Drain Wire & 2CX1.5 Sq.mm, 300/500 V, FR Insulated, FR Sheathed, Fire Alarm Shielded Cable With Drain Wire as per IEC 60331-11-21 for M/s. SQ Wire & Cable Co., Ltd, Bangladesh.
- Type test on 19/33 kV, 3CX400 Sq.mm, XLPE Cable as per IEC 60502-2 for M/s. Doha Cables, Qatar.

- Type test on 22 kV, Separable Connector as per IEC 60502 (Part-4) 2021 for M/s. 3M Asia Pacific, Singapore.

Electrical Appliances Technology Division (EATD)

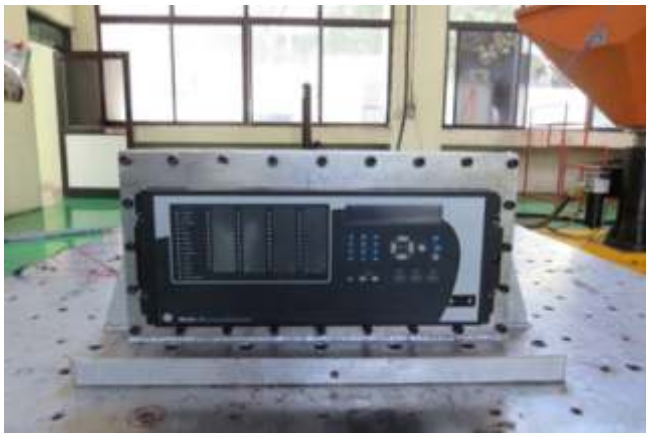
- IP 68 category 1 test as per IEC 60529 on 132 kV 6+1 and 3+1 SVL Link Boxes for M/s. Evergrow Electrical Engg. Supplies, Malaysia.
- IP 55 category 2 test on 250A LT Panel for M/s. NG Electro Power, Nepal.
- IP 4X test on 160A Fuse Switch Disconnector for M/s. Tenaga Prisma Manufacturing Sdn. Bhd., Malaysia.

Earthquake Engineering & Vibration Research Centre (EVRC)

- Vibration test and Shock test on Traction Converter for M/s. CAF Power & Automation, S.L, Spain.

Vibration test and Shock test on Traction Converter

- Seismic test on Line Current Differential System for M/s. GE Industrial of PR LLC., U.S.A.



Seismic test on Line Current Differential System

- Vibration and shock test on Contactors for M/s. ABB Electrification Sweden AB, Sweden

Vibration and shock test on Contactors

- Bump test and Seismic test on Ethernet access network switch for M/s. ECI Telecom Ltd., Israel

Bump test and Seismic test on Ethernet access network switch

- Random Vibration test and Shock test on Battery Cabinet for M/s. Schneider Electric, France.

Random Vibration test and Shock test on Battery Cabinet

High Voltage Division (HVD)

- Lightning Impulse withstand test and Power Frequency Withstand test on 132kV Composite Cross Arm for M/s. Smart Reliance SDN BHD, Selangor, Malaysia.
- Lightning Impulse Voltage withstand test (chopped) on 1250kVA, 11/0.415kV 3Ph Distribution Transformer for M/s. Automation Engineering, Bangladesh.

Short Circuit (SC) Lab

- Thermal short-circuit tests on Conductor (35.4kA rms for 1 s) and Screen (5.1kA rms for 1 s) on Pre molded slip on indoor termination at one end & test termination at the other end & pre molded straight through joint mounted on 3 x 300 sq.mm, Aluminium conductor, XLPE insulated PVC sheathed 6.35/11 (12) kV Cable as per HD 629.1 S3:2019 for M/s. REPL (Malaysia) Sdn. Bhd., Malaysia.
- Verification of short circuit withstand strength tests at 50kA for 1.0 s with 105 kA peak on main bus bars, at 30 kA for 1.0 s with 63 kA peak on neutral bus bar on 415V, 4000A Indoor LT Panel as per IEC 61439-1: 2020 & IEC 61439-2:2020 for M/s. NG Electro Power Pvt. Ltd., Nepal.
- Short-time withstand current test at 5kA rms for 1.0 s with 7.65 peak and Short-circuit making capacity test at 1.2 kA rms with 1.8 kA peak under Test sequence III: short-circuit performance capability on 415V 160A LV Fuse Switch Disconnector as per IEC 60947-3: 2020 for M/s. Tenaga Prisma Manufacturing Sdn. Bhd, Malaysia.
- Through fault test at 50kA rms for 0.25s on 4.16kV 95A Air Insulated Terminal Box as per Customer's instructions for M/s. Toshiba Mitsubishi – Electric Industrial Systems Corporation (TMEIC), Japan.
- Short-time withstand current & peak withstand current tests at 31.5kA rms for 3.0s with 81.9kA peak on Earth Switch only for 17.5kV 2500A 3 phase Metal Enclosed AC Switchgear as per IEC 62271-102: 2018 for M/s. SE-CEE Schneider Electric Kozep Kelet Europai KFT, Hungary.
- Short-time withstand current and peak withstand current tests at 31.5kA rms for 3s and 69.3kA peak on 132kV Outdoor Surge Voltage Limiter Earth Link Box as per Customer's instructions for M/s. Evergrow Electrical Engineering Supplies Sdn.Bhd., Malaysia.
- Ability to Withstand the Dynamic Effects of Short Circuit & Temperature Rise tests on 15kVA & 25kVA Single Phase Pole Mounted Distribution Transformers and 200kVA 11000/415V & 315kVA 11000/415V Three Phase Distribution Transformers as per IEC 60076 - 5: 2006 & IEC 60076-2: 2011 for M/s. Akota Power Limited, Dhaka, Bangladesh.

Smart Grid Research Laboratory (SGRL)

- IEC 61850 conformance testing of IEDs (Prometer 100 & Prometer 540) for M/s. Secure Meters (Sweden) AB, Sweden.

Switchgear Testing & Development Station (STDS), Bhopal

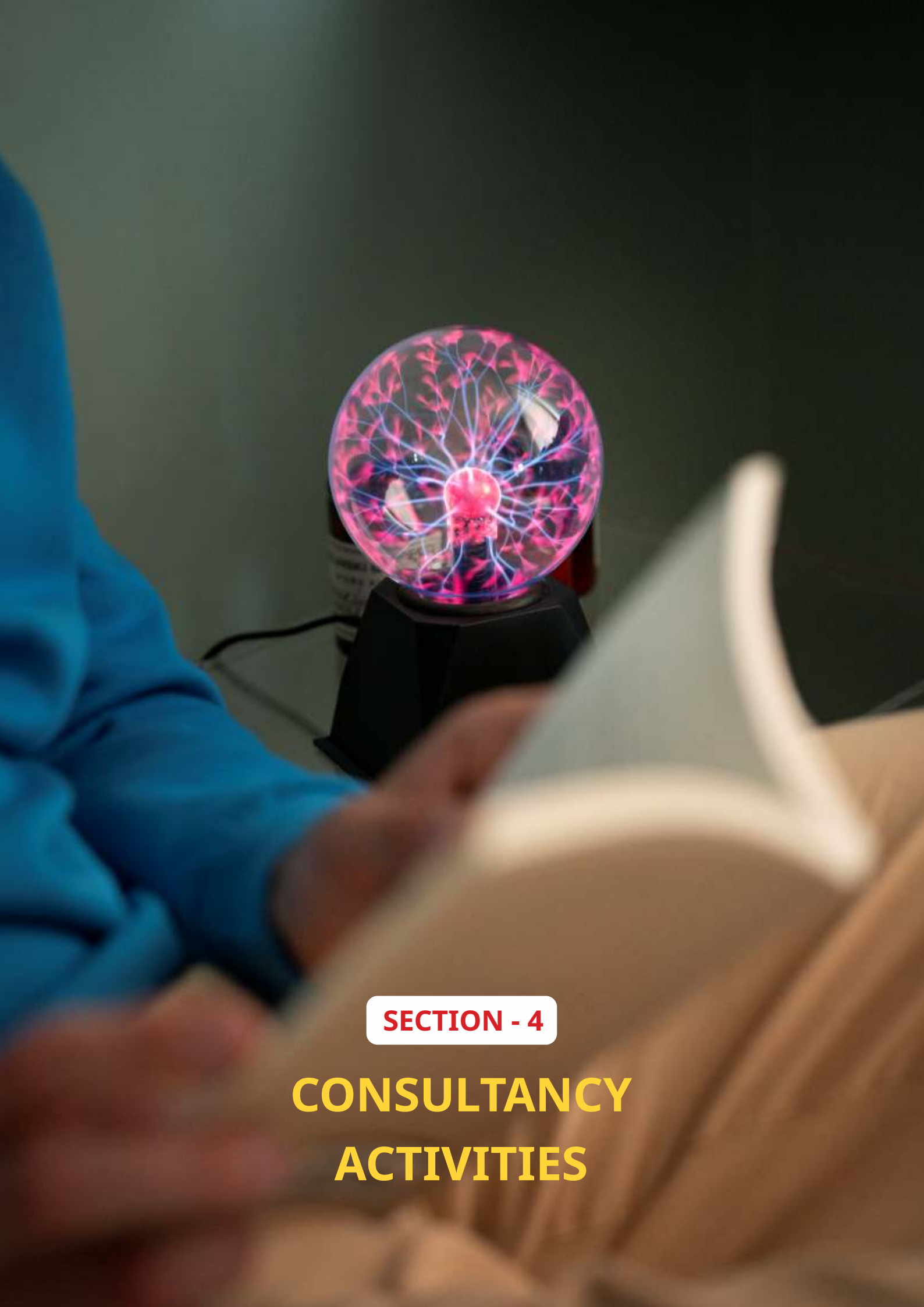
- Impulse Voltage withstand Test, Temperature Rise test and Ability to withstand the dynamic effects of short circuit test on 2500kVA, 11/0.415kV, Three Phase Distribution Transformer for M/s. Powermann Bangladesh Ltd., Bangladesh.
- Ability to withstand the dynamic effects of short circuit test on the following Distribution Transformers for M/s. First Philec INC, Phillippines.

a) 75 kVA, 19.92 (34.5Grd.Y)/0.240(2x0.120) kV, 1-Phase, Oil immersed Distribution Transformer (Pole Type)

b) 100 kVA, 14.4 (24.94Grd.Y)/0.240(2x0.120) kV, 1-Phase, Oil immersed Distribution Transformer (Pole Type)

c) 75 kVA, 19.92 (34.5Grd.Y)/0.240(2x0.120) kV, 1-Phase, Oil immersed Distribution Transformer (PAD Mounted)

- Ability to withstand the dynamic effects of short circuit test on 1000kVA, 24/0.416kV, Distribution Transformer for M/s. Thai Maxwell Electric Co. Ltd., Thailand.
- Routine Test and Ability to withstand the dynamic effects of short circuit test on 5000kVA, 33/11 kV, 3-Phase, Power Transformer for M/s. LTL Transformers (Pvt.) Ltd., Sri Lanka.



SECTION - 4

CONSULTANCY ACTIVITIES

CONSULTANCY ACTIVITIES

RLA Studies

CPRI acquired significant knowledge and experience in RLA (Remaining Life Studies) of power plant components, such as generators, turbines, boilers, and so on.

In order to assess the boiler's life, non-destructive and destructive tests will be conducted on its major internal components, including water wall tubes, super-heater coils, re-heater coils, and their corresponding headers.

CPRI will do comprehensive condition monitoring of the penthouse, furnace, and water wall tubes in addition to corrosion mapping of water wall tubes.

In a similar manner, tests are conducted on the turbine's subcomponents, such as blades, diaphragms, IP, LP and HP turbines, to assess the turbine's lifespan. CPRI uses the CFD like software study to assess additional information as well.

CPRI also diagnoses the condition of generators, transformers and other electrical equipment with tests PD, tan delta test, IR test, ELCID, wedge mapping etc. tests.

CPRI also carries out RLA studies and Condition monitoring studies on the Hydro power plant and Gas turbine power plants.

R&M studies and LE studies of thermal and hydro power plants are conducted by CPRI using its experience in RLA and condition monitoring studies of boilers, turbines, generators, transformers, breakers, protection equipment and switchyard equipment. For the thermal, hydro and gas turbine plants, CPRI prepares dependable Detailed Project Reports (DPR) for Renovation and modernization of old plants.

Field Diagnostic Services

CPRI has facilities for conducting field diagnostic testing and condition assessment of HV Power Equipment like Power Transformers, Hydro and Turbo Generators, Power Cables, Large AC Motors, Current Transformers (CTs), Capacitance Voltage Transformers (CVTs), Lightning Arresters, Circuit Breakers etc. in service. The laboratory has adequate experience and expertise in conducting Residual Life Assessment Studies on High Voltage Substation and Power Plant Electrical Equipment in service. Diagnostic Laboratory is an accredited Laboratory as per ISO 9001-2015 Quality Management System for undertaking field engineering consultancy services for various utilities

Test / Equipment Facilities

- Insulation Resistance Meter up to 5kV DC
- Automatic Capacitance and Tan Delta Test System with Resonator up to 12 kV
- Recovery Voltage Meter up to 2 kV DC
- Dielectric Spectroscopy Test Kit
- Polarization Depolarization Current Kit
- Sweep Frequency Response Analysis Test Kit
- Leakage Reactance/Short Circuit Impedance Measurement Kit
- Automatic Three Phase Transformer Turns Ratio Meter
- Winding Resistance Meter up to 50 A DC
- Partial Discharge Detection System by Acoustic Emission
- Partial Discharge Detection System
- Advanced Winding Analyser Kit for Surge Comparison, DC Leakage Current and DC High Potential Test up to 12 kV
- Rotor Reflectometer
- Electro Magnetic Core Imperfection Detector (ELCID)
- Wedge Tightness Detector
- HV Dielectric Spectroscopy
- VLF Cable Diagnosis Test System up to 42kV rms, 60 kV peak
- Damped AC Partial Discharge Test System up to 42kV rms, 60 kV peak
- DC Dielectric Test Set up to 100 kV DC
- Circuit Breaker Analyser

Consultancy:

- Consultancy through Field Testing
  - * Test facilities for undertaking condition monitoring/diagnostic tests on HV Power Equipment in order to assess the state and condition of their insulation systems
  - * Mobile Field Testing Vehicle with diagnostic test facilities for conducting diagnostic tests on HV Power Equipment at site.
- Involved in Renovation and Modernization (R&M) & Residual Life Assessment (RLA) Studies.

Clientele

Diagnostics test facilities are extensively used by State Electricity Boards, Thermal Power Stations, Nuclear Power Stations, Petro Chemical Plants, Process Industries and the like.

Special Consultancy Activities

Cables & Diagnostics Division (CDD)

- Diagnostic tests on 40 MVA, 132/33 kV Power Transformer for M/s. Northern Coalfields Limited, Singrauli.
- Condition Monitoring / Diagnostic Tests on 170 MW, 13.8 kV Hydro Generators, 400 kV CVTs, 400 kV Lightning Arrestors for M/s. NHPC Ltd., Teesta-V Power Station, Sikkim.
- Condition Monitoring / Diagnostic Tests on 43.33 MVA, 11/220kV Generator Transformers for M/s. NHPC Ltd., Salal Power Station, J&K.
- Condition Monitoring / Diagnostic Tests on 135 MW, 11 kV Hydro Generators for M/s. NEEPCO Ltd., PLHPS, Hoj, Arunachal Pradesh.
- Condition Monitoring/Diagnostic tests on 315 MVA, 27/420kV Generator Transformers for M/s. RPCL, Yeramarus Thermal Power Station, Raichur.

Energy Efficiency & Renewable Energy Division (ERED)

- Performance testing of one NDCT and two Condensers (one HP and one LP) at Jaypee Nigrie Super Thermal Power Plant, Madhya Pradesh.
- Detailed Auxiliary Power Consumption Audit of 2 x 210 MW + 3 x 500 MW Units (Unit-3 to Unit-7) of M/s. Maharashtra State Power Generation Company Limited, Chandrapur Super Thermal Power Station, Chandrapur.
- Auxiliary power consumption audit at Paras Thermal Power Station, Maharashtra.
- Study of penstock flow measurement for 4 x 100 MW Units of M/s. THDCIL, Koteshwar Hydro Electric Power, Uttarakhand.
- Head measurement, Pumps and Blower efficiencies for M/s. NHPC Ltd., Chamera 1 Hydro Power Station, Himachal Pradesh.

High Voltage Division (HVD)

- Step Response measurement on Voltage Divider for M/s. Kirloskar Electric Co. Ltd, Mysore.
- Measurement of earth resistance at the site of M/s. Rohde and Schwarz India Private Limited, Bengaluru.
- Soil Resistivity Measurement during dry summer and dry winter as part of Design of Grounding System for 382MW Sunni Dam HEP for M/s. SJVNL, Shimla.

Soil Resistivity Measurement as part of Design of Grounding System for 382MW Sunni Dam HEP

- Earthing evaluation studies for M/s. Neyveli Lignite Corporation India Limited.
- Soil Resistivity Measurement at the site of M/s. Vijay Electric, Bangalore.

Materials Technology Division (MTD)

- Corrosion Mapping of Boiler Water Wall tubes of Unit No.3 for M/s. NTPC Limited, Jamnipali, Korba.
- Corrosion Mapping of Boiler Water Wall tubes of Unit No.3 for M/s. NTPC Limited, Kaniha, Talcher.

Corrosion Mapping of Boiler Water Wall tubes of Unit No.3 for M/s. NTPC Kaniha, Talcher

- Corrosion Mapping of Boiler Water Wall tubes of Unit No.4, 500 MW for M/s. NTPC Limited, Korba Super Thermal Power Station, Korba.

Corrosion Mapping of Boiler Water Wall tubes of Unit No.4, 500 MW for M/s. NTPC Limited, Korba Super Thermal Power Station, Korba

- Corrosion Mapping of Boiler Water Wall tubes of Unit No.1, 500 MW for M/s. NTPC Limited, Simhadri, Visakhapatnam.
- Inspection of Reheater tubes for M/s. HNPCL, Visakhapatnam.
- Corrosion Mapping of Boiler Water Wall tubes of Unit No.2, 210 MW for M/s. NTPC Limited, Unchahar, Uttar Pradesh.

Mechanical Engineering Division (MED)

- Vetting/Checking the Pile Foundation Design Calculation & Drawings of 220 kV D/C Type "DD+18" Tower at Mechi River (Panidubbi Village) (Location No-49/0, 50/0 & 51/0-Mid Stream) for M/s. Bihar State Power Transmission Company Limited (BSPTCL).
- Vetting/Checking the Raft Foundation Design Calculations & Drawings of 132kV Cable Termination Structure for Tower Marked TE & TM for M/s. Haryana Vidyut Prasaran Nigam Limited (HVPNL).
- Vetting/ Checking the Design Calculations & Drawings of 66 kV D/C Type "PD (30O-60O)/DE _16M BXA_ with Single Sided Arm" Tension Monopole for M/s. DLF Home Developers Limited.
- Vetting/ Checking the Design Calculations & Drawings of 66 kV D/C Type "PB (2O-15O) _15M BXA" Tension Monopole for M/s. Punjab State Power Corporation Limited (PSPTCL).
- Vetting/Checking the Design Calculation & Single Line Drawing of 132 kV D/C Type "SPL-1" (Snow Zone) (0O – 10O Dev) Tension Tower for M/s. Jammu & Kashmir Power Transmission Corporation Limited (JKPTCL).
- Vetting/ Checking the Design Calculations & Drawings of 220 kV D/C Type "2DP4+0M (0O-5O Entry & Exit at 90O) / DE (0O-5O) with Auxiliary Arm" Tension Monopole at Location No-5 for M/s. Karnataka Power Transmission Corporation Limited (KPTCL).

Power System Division (PSD)

- Lightning Overvoltage Studies and Earthing Evaluation Studies in 220/400kV (GIS) and Power Transformers of NNTPS for M/s. NLC India Limited, Neyveli, Tamilnadu.

Visit to M/s. NLC India Limited, Neyveli, Tamilnadu in connection with Lightning Overvoltage Studies and Earthing Evaluation Studies in 220/400kV (GIS) and Power Transformers of NNTPS

- Electrical System study and relay coordination of 400kV System for M/s. Jaypee Bina Thermal Power Plant.
- Field testing of numerical protection relay at M/s. NHPC Limited, Loktak Power Station, Manipur.

Relay testing at Loktak Power Station

- Protection Audit of 765kV, 400kV, 220 kV substations of M/s. PGCIL, Bhuj-II GIS, Bhind & Guna.
- Protection Audit of ten Power Stations of M/s. UJVN Ltd. - Chhibro, Chilla, Dhakrani, Dhalipur, Kalagarh, Khatima, Khodri, Kulhal, Tiloth - MB1 & MB-2.

SECTION - 5

PROMOTIONAL ACTIVITIES

PROMOTIONAL ACTIVITIES

Important Conferences/ Webinars/ Training Programmes Organised

1. Webinar on “Cybersecurity in Energy Sector” for the employees of M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations, on 03rd May 2023.
2. Workshop on “Condition Assessment of RCC Foundation of Boiler Auxiliaries ID Fan, FD Fan, PA Fan, and Bowl mills” held at M/s. NTPC Limited, Singrauli Super Thermal Power Station, Singrauli on 11th May 2023.
3. Training Program on “Diagnosis of Transformer – Online & Offline Tests on Shunt Reactors / Transformers” – online and offline at site for the officials of M/s. PGCIL, 400/220kV Substation, Hassan, Karnataka, on 01st July 2023.
4. Webinar on “Draft Indian standard for onsite diagnostic testing of power transformers for condition/health assessment” for members from various state and central Utilities on 04th September 2023.
5. Webinar on “Conditioning monitoring of Transformers using oil analysis” for the Engineers of M/s. Druk Green Power Corporation Limited (DGPCL), Bhutan on 08th September 2023.
6. Workshop on “Significance of Ingress Protection and Testing Modalities” on 24th November 2023.
7. National Conference on “Latest Developments in Design & Testing of Transmission Line Towers/Poles & its Accessories” held at CPRI, Bengaluru on 14th & 15th December 2023
8. National Conference - "ARCON 2024” with the theme "Internal Arc – Causes and Effects: A Panoramic View" held at CPRI, Bengaluru, on 18th & 19th January 2024.
9. National Conference on “Smart Grid, Smart Meter, Communication Technologies and Cyber Security” held at CPRI, Bangalore on 14th & 15th February 2024.
10. Webinar on “Methods for improvement of Partial Discharge on High Voltage Apparatus” held on 22nd March 2024.

Awards & Accolades

- Shri Dillip Kumar Puhan, Engineering Officer Gr.4, CPRI, Bengaluru received BEST PAPER AWARD for the technical Paper titled "Offline Partial Discharge Diagnosis of Electrical Machine Insulation System - Case Studies", authored by Rajat Sharma, Dillip Kumar Puhan and K. P. Meena at the 11th International Conference on Electrical and Electronic Insulation Materials & Systems - INSULEC held in Mumbai, on 01st & 02nd February 2024. A Photograph is placed below:

- The technical paper titled "Design and Analysis of 3-Phase Hybrid Asymmetric Multilevel Inverter Topology with Reduced CMV" authored by Mamatha N, Ramesh H R and Jeykishan Kumar K was awarded the BEST PAPER Certificate, at the IEEE International Conference on Green Energy, Computing and Sustainable Technology 2024 held from 17th to 19th January 2024.
- Shri Jeykishan Kumar K, Engineering Officer Gr.2, CPRI, Bengaluru received IEEE Protsahan Award in Recognition for his contribution towards Research Publication in Energy Storage Journal on paper titled “Standards for Electric Vehicle Charging Stations in India: A Review”, authored by Jeykishan Kumar K., Sudhir Kumar R. and Nandakumar V.S. having a journal impact factor of 3.2 during October 2021-September 2022. The award was granted by IEEE ComSoc Bangalore Chapter on 03rd April 2023 at CMR Institute of Technology, Bengaluru.
- Shri. Kishore Kumar Gulipilli, Joint Director, CPRI, Bengaluru received the BEST PAPER AWARD for the technical paper titled, “Characteristics of Coffee Husk Blending with Indian Coal and Study

the Thermal Behavior for Power Generation" at the International Conference on "CHEMCON 2023 on Energy Transition: Challenges and Opportunities" organized by Indian Institute of Chemical Engineers at Heritage Institute of Technology, Kolkata from 27th to 29th December 2023.

- The Technical paper titled "Characteristics of Voltage Distribution on Healthy and Damaged Insulator Strings Under Dry Conditions with Clean and Different Pollution Severities" authored by K. Devender Rao, P. Rajamani, A. Ashok Babu, T. Bhavani Shanker was awarded the BEST PAPER at the 'International Conference on Sustainable Power and Energy Research' organized by National Institute of Technology, Warangal from 01st to 03rd March 2024.

Visit of Important Persons/Foreign Delegations to CPRI

Electrical Appliances Technology Division (EATD)

- Ms. Ir. Noradliana binti Md. Sabri & Mr. Ir. Thevindra Raj from M/s. Tenaga Nasional Berhad, Malaysia and Mr. Yap Kwee Hin from M/s. Evergrow Electrical Engg. Supplies, Malaysia visited Electrical Appliances Technology Division, CPRI, Bengaluru for witnessing of IP 68 category 1 test as per IEC 60529 on 132 kV 6+1 and 3+1 SVL Link Boxes, on 05th October 2023.

Visit of Ms. Ir. Noradliana binti Md. Sabri & Mr. Ir. Thevindra Raj from M/s. Tenaga Nasional Berhad, Malaysia and Mr. Yap Kwee Hin from M/s. Evergrow Electrical Engg. Supplies, Malaysia

- Mr. Ahmed Fayed from M/s. DEWA, Dubai and Mr. Gyanmani Rai from M/s. Asiatic Electricals & Switchgear Pvt. Ltd, Rajasthan visited Electrical Appliances Technology Division, CPRI, Bengaluru for witnessing of IP 43 test as per IEC 61439 on 500, 800A, 6W transformer mounted LVBD on 25th September 2023.

Visit of Mr. Ahmed Fayed from M/s. DEWA, Dubai and Mr. Gyanmani Rai from M/s. Asiatic Electricals & Switchgear Pvt. Ltd, Rajasthan

- Mr. Kashiram Bhattaral from M/s. NG Electro Power, Nepal visited Electrical Appliances Technology Division, CPRI, Bengaluru for witnessing of IP 55 category-2 test on 250A LT Panel, on 23rd August 2023.

Visit of Mr. Kashiram Bhattaral from M/s. NG Electro Power, Nepal

- Mr. Wan Mohd Syahmi Bin Wan Othman and Mr. Mohd Khir Bin Hamzah from M/s. Tenaga Prisma Manufacturing Sdn Bhd., Malaysia visited Electrical Appliances Technology Division, CPRI, Bengaluru for witnessing of IP 4X test on 160A Fuse Switch Disconnector, on 25th August 2023.

Visit of Mr. Wan Mohd Syahmi Bin Wan Othman and Mr. Mohd Khir Bin Hamzah from M/s. Tenaga Prisma Manufacturing Sdn. Bhd., Malaysia

- Mr. Nizar Kilani from M/s. DEWA, Dubai and Mr. Sanjeev Kumar (AGM- R&D) from M/s. Novateur Electrical & Digital Systems Pvt. Ltd, Haryana visited Electrical Appliances Technology Division, CPRI, Bengaluru for witnessing IP 43 test as per IEC 61439 on 500V, 400A, 6W Mini Distribution Pillar, on 25th March 2024.

Visit of Mr. Nizar Kilani from M/s. DEWA, Dubai and Mr. Sanjeev Kumar (AGM- R&D) from M/s. Novateur Electrical & Digital Systems Pvt. Ltd, Haryana

Earthquake Engineering and Vibration Research Centre (EVRC)

- Mr. Erroicenea Ochotorena Ander & Mr. Horvath Tibor Oedon from M/s. CAF Power & Automation, Spain visited Earthquake Engineering and Vibration Research Centre, CPRI, Bengaluru for witnessing Vibration test and Shock test on Traction Converter from 17th to 21st April 2023.

High Voltage Division (HVD)

- Mr. Muhammad Hanaffi Bin Muhammad Taib, Mr. Wan Famy Azil Bin Wan Ahmad, Mr. Amir Farhan Bin Mohamad Fadzil from M/s. TNB, Malaysia visited High Voltage Division, CPRI, Bengaluru for witnessing of tests on 132kV Composite Cross Arm for M/s. Smart Reliance Sdn. Bhd., Malaysia on 14th September 2023.

Visit of Mr. Muhammad Hanaffi Bin Muhammad Taib, Mr. Wan Famy Azil Bin Wan Ahmad, Mr. Amir Farhan Bin Mohamad Fadzil from M/s. TNB, Malaysia

- Mr. Senzo Zabapostoli Shongwe, Mr. Makabongwe United Mavuso from M/s. EEC Eswatini, South Africa visited High Voltage Division, CPRI, Bengaluru for witnessing of tests on 132kV Insulator Strings for M/s. IAC Electricals Pvt. Ltd., Kolkata, from 16th to 29th October 2023.

Visit of Mr. Senzo Zabapostoli Shongwe, Mr. Makabongwe United Mavuso from M/s. EEC Eswatini, South Africa

- Mr. Rmal Sabah, Assistant Engineer and Mr. Raju Ahmed, Sub- Assistant Engineer from M/s. PGCB Ltd., Bangladesh visited High Voltage Division, CPRI, Bengaluru for witnessing of RIV Test on 11kV Disc Insulators manufactured by M/s. Aditya Birla Insulators, Rishra, West Bengal, on 24th November 2023.

Visit of Mr. Rmal Sabah, Assistant Engineer and Mr. Raju Ahmed, Sub- Assistant Engineer from M/s. PGCB Ltd., Bangladesh

Metering & Utility Automation Division (MUAD)

- Mr Yasuhito Hidaka, Assistant Manager from M/s. Fuji Electric Meter Co., Ltd, Japan visited Metering & Utility Automation Division, CPRI, Bengaluru for discussion regarding testing of Smart Meters, on 12th September 2023.

Visit of Mr Yasuhito Hidaka, Assistant Manager from M/s. Fuji Electric Meter Co., Ltd, Japan

Short Circuit Laboratory (SCL)

- Mr. Ahmed M Fayed from M/s. DEWA, Dubai visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Verification tests (Temperature-rise, Dielectric properties, Protection against electric shock and integrity of protective circuits, Mechanical operation, Lifting, Mechanical impact, Clearances and creepage distances, Marking, Resistance to abnormal heat and fire due to internal electric effects, Short-circuit withstand strength test at 40kA rms for 1 s with 84 kA peak on main bus bars) on 500V 800A 50Hz 6Way LV Distribution Board as per IEC 61439-1: 2020 & IEC 61439-2 :2020 and DEWA requirements for M/s. Asiatic Electrical & Switchgear Pvt. Ltd., Rajasthan, during 03rd to 11th October 2023.

Visit of Mr. Ahmed M Fayed from M/s. DEWA, Dubai

- Mr. Karelas Georgios, Quality Inspector from M/s. HEDNO, Greece visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Ability to withstand the dynamic effects of short circuit test & Thermal ability to withstand short circuit test on 100kVA 20000/400V & 160kVA 20000/400V Three Phase Distribution Transformers, for M/s. Shirdi Sai Electricals Ltd., Kadapa, A.P., on 30th August 2023.

Visit of Mr. Karelas Georgios, Quality Inspector from M/s. HEDNO, Greece

- Mr. Mohamed Isa, Electrical Engineer from Electricity and Water Authority, Bahrain visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Thermal short-circuit tests on Conductor (35.4kA rms for 1 s) and Screen (5.1kA rms for 1 s) on Pre molded slip on indoor termination at one end & test termination at the other end & pre molded straight through joint mounted on 3 x 300 sq.mm, Aluminium conductor, XLPE insulated PVC sheathed 6.35/11 (12) kV Cable as per HD 629.1 S3:2019 for M/s. REPL (Malaysia) sdn. Bhd, Malaysia, on 08th & 09th May 2023.

Visit of Mr. Mohamed Isa, Electrical Engineer from Electricity and Water Authority, Bahrain

- Mr. Moin Khan from M/s. Faisal Jassim Industries LLC, U.A.E & Mr. Basanth V. B from M/s. Under Writers Laboratory (UL), India visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Verification of short circuit withstand strength at 50kA for 1.0 s with 105 kA peak on main bus bars, at 30 kA for 1.0 s with 63 kA peak on neutral bus bar on 415V 1250A Indoor LT Panel as per IEC 61439-1: 2011 & IEC 61439-2:2011, on 27th July 2023.

Visit of Mr. Moin Khan from M/s. Faisal Jassim Industries LLC, U.A.E & Mr. Basanth V. B from M/s. Under Writers Laboratory (UL), India

- Mr. Kashiram Bhattarai, Engineer from M/s. NG Electro Power Pvt. Ltd., Nepal visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Verification of short circuit withstand strength tests at 50kA for 1.0 s with 105 kA peak on main bus bars, at 30 kA for 1.0 s with 63 kA peak on neutral bus bar on 415V 4000A Indoor LT Panel as per IEC 61439-1: 2011 & IEC 61439-2:2011, on 22nd August 2023.

Visit of Mr. Kashiram Bhattarai, Engineer from M/s. NG Electro Power Pvt. Ltd., Nepal

- Mr. Wan Mohd Syahmi Bin Wan Othman, Senior Executive – Technical and Mr. Mohd Khir Bin Hamzah, Quality Technical & Engineering Manager from M/s. Tenaga Prisma Manufacturing Sdn. Bhd, Malaysia visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Short-time withstand current test at 5kA rms for 1.0 s with 7.65 peak and Short-circuit making capacity test at 1.2 kA rms with 1.8 kA peak under Test sequence III: short-circuit performance capability on 415V 160A LV Fuse Switch Disconnector as per IEC 60947-3: 2020:2011, on 24th & 25th August 2023.

Visit of Mr. Wan Mohd Syahmi Bin Wan Othman, Senior Executive – Technical and Mr. Mohd Khir Bin Hamzah, Quality Technical & Engineering Manager from M/s. Tenaga Prisma Manufacturing Sdn Bhd, Malaysia

- Mr. Bhagwan Singh, representative from M/s. REPL (Malaysia) Sdn. Bhd., Malaysia and Mr. Ahmed Khalil Ali Ebrahim Hasan Nayem Alhayki, Engineer from M/s. EWA (Electricity & Water Authority), Bahrain visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Thermal and Dynamic short-circuit tests on Conductor (35.3 kA rms for 1 s with 90 kA peak) and Thermal short-circuit test on Screen (5.1 kA rms for 1 s) on Premolded slip on straight through joint with outer resin mounted on 3 x 300 sq.mm, Aluminium conductor, XLPE insulated PVC sheathed 6.35/11 (12) kV Cable as per HD 629.1 S3:2019 standard, on 11th & 12th October 2023.

Visit of Mr. Bhagwan Singh, representative from M/s. REPL (Malaysia) Sdn. Bhd, Malaysia and Mr. Ahmed Khalil Ali Ebrahim Hasan Nayem Alhayki, Engineer from M/s. EWA (Electricity & Water Authority), Bahrain

- Mr. Peter Yap Kwee Hin, Managing Director from M/s. Evergrow Electrical Engineering Supplies Sdn.Bhd, Malaysia and Mr. Mohammad Fakharurazi Bin Shafie, Design Engineer (Overhead Lines & Cables) & Ms. Nur Haliza Binti Mohd Aris, Project Manager from M/s. Tenaga Nasional Berhad, Malaysia visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Short-time withstand current and peak withstand current tests at 31.5kA rms for 3 s and 69.3kA peak on 132kV Outdoor Surge Voltage Limiter Earth Link Box as per Customer's instructions on 07th December 2023.

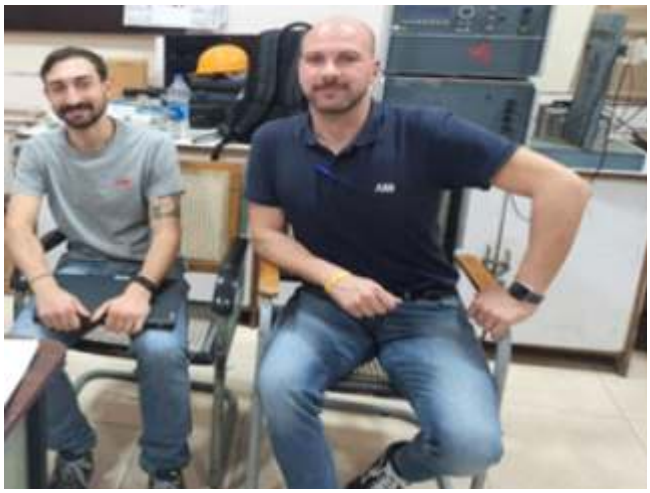
Visit of Mr. Peter Yap Kwee Hin, Managing Director from M/s. Evergrow Electrical Engineering Supplies Sdn. Bhd, Malaysia and Mr. Mohammad Fakharurazi Bin Shafie, Design Engineer (Overhead Lines & Cables) & Ms. Nur Haliza Binti Mohd Aris, Project Manager from M/s. Tenaga Nasional Berhad, Malaysia

- Mr. Md. Zahedul Islam, Executive Director and Mr. Md. Ahsanul Kabir, Dy. Manager from M/s. Akota Power Limited, Dhaka, Bangladesh visited Short Circuit Laboratory, CPRI, Bengaluru for witnessing Ability to Withstand the Dynamic Effects of Short Circuit & Temperature Rise tests on 15kVA & 25kVA Single Phase Pole Mounted Distribution Transformers and 200kVA 11000/415V & 315kVA 11000/415V Three Phase Distribution Transformers as per IEC 60076 - 5: 2006 & IEC 60076-2: 2011 during 11th to 19th January 2024.

Visit of Mr. Md. Zahedul Islam, Executive Director and Mr. Md. Ahsanul Kabir, Dy. Manager from M/s. Akota Power Limited, Dhaka, Bangladesh

Switchgear Testing & Development Station (STDS), Bhopal

- Mr. Roberto Amboni and Mr. Diego Desirello from M/s. ABB S.p.A Bergamo, Italy visited STDS, Bhopal for witnessing Test sequence-1 on 415V, 160A, MCCB's for M/s. ABB India Ltd., Bengaluru on 30th October 2023.



Visit of Mr. Roberto Amboni and Mr. Diego Desirello from M/s. ABB S.p.A Bergamo, Italy

- Mr. M.M. Hassan Mamoon, Managing Director and Mr. Delwor Hossain, Technician from M/s. Powermann Bangladesh Ltd., Dhaka, Bangladesh visited STDS, Bhopal for witnessing Impulse Voltage withstand Test, Temperature Rise test and Ability to withstand the dynamic effects of short circuit test on 2500kVA, 11/0.415kV, Three Phase Distribution Transformer on 22nd January 2024.
- Mr. Fabio and Mr. Carlo from M/s. ABB S.p.A Bergamo, Italy visited STDS, Bhopal for witnessing Test Sequence-II, III & IV on 415V, 630A, FP MCCB's (Electrical & Thermal Magnetic) for M/s. ABB India Ltd., Bengaluru on 17th January 2024.

Visit of Mr. Fabio and Mr. Carlo from M/s. ABB S.p.A Bergamo, Italy

- Mr. Mahmood Alsaegh from M/s. EWA, Bahrain visited STDS, Bhopal for discussions regarding testing on 29th January 2024.

Visit of Mr. Mahmood Alsaegh from M/s. EWA, Bahrain

Participation in Conferences / Exhibitions

NIMA Power 2023 Exhibition

The Institute participated in NIMA Power 2023 Exhibition organised by Nashik Industries and Manufacturers' Association (NIMA), Maharashtra, during 19th to 22nd May 2023 in Satpur MIDC Nashik. The exhibition was aimed at fostering entrepreneurship, enhancing exports of MSMEs, scaling up small businesses, and networking that helps to make more entrepreneurs & strengthen the ecosystem in the Nashik region. The theme of the exhibition was on the "Empower Energy Ecosystem" in the Nashik region to make a Pan India platform for every business from Nashik.

CPRI displayed its facilities and credentials in a 16 sq.m Shell Scheme. Since CPRI is establishing a new unit in Nashik and the region is a switchgear hub, the exhibition provided a forum for promoting the facilities and expertise of the Institute to electrical equipment manufacturers and key decision-makers of the power sector.

The Event was inaugurated by Shri Uday Samant, Minister for Industries, Maharashtra State and Shri Dadaji Bhuse, Guardian Minister of Nashik and CPRI was presented a Token of Gratitude by the Honourable Minister. Photographs are placed below:

Environment and Energy Expo 2023

The Institute participated in Environment and Energy Expo organized by NNS Media Group from 21st to 23rd July 2023, at Pragati Maidan, New Delhi. The Event was inaugurated by Shri S.P. Singh Baghel, Hon'ble Minister of State for Health and Family Welfare, Govt. of India and and the Honourable Minister visited CPRI Stall.

Shri S.P. Singh Baghel, Hon'ble Minister of State for Health and Family Welfare, Govt. of India visiting CPRI Stall

India International Trade Fair (IITF) Exhibition

The Institute participated in India International Trade Fair (IITF) Exhibition, oganised by ITPO during 14th to 27th November 2023 at Bharat Madapam, Pragati Maidan, New Delhi. The Theme for IITF was "Vasudhaiva Kutumbakam: United by Trade". Ministry of Power organised and made Power Pavillion with participation of CPSEs and CPRI was one among them. Honourable Union Cabinet Minister for Power Shri Raj Kumar Singh inaugurated the Power Pavilion on 14th November 2023. CPRI showcased its test facilities on the digital posters at the power pavilion. Photographs are placed below:

Inauguration of Power Pavilion by Honorable Union Minister for Power Shri Raj Kumar Singh

Panoramic view of Power Pavilion at Pragati Maidan

DistribuElec Exhibition

The Institute participated in DistribuElec Exhibition organised by IEEMA during 16th to 18th January 2024 at Bombay Exhibition Centre, Mumbai. Honorable Union Cabinet Minister for Power, Shri Raj Kumar Singh inaugurated the Exhibition on 16th January 2024. CPRI displayed its facilities and expertise in a Stall during the exhibition. Photographs are placed below:

Inauguration speech by Hon'ble Union Minister for Power, Shri Raj Kumar Singh

Visitors from M/s. Manama Switchgear, Bahrain

Exhibition as part of National Conference on "Smart Grid, Smart Meter, Communication Technologies and Cyber Security"

CPRI organzied an Exhibition as part of two days National Conference on "Smart Grid, Smart Meter, Communication Technologies and Cyber Security" conducted by Smart Grid Research Laboratory and Metering & Utility Automation Division of CPRI, Bengaluru.

- Inauguration : Shri B. A Sawale, Director General, CPRI
- Venue: CPRI, Bengaluru
- Dates: 14th to 16th February 2024

CPRI's stall at the exhibition showcased state-of-the-art test facilities and other activities.

Painting Competition on Energy Conservation

The State Level Painting Competition 2023 on Energy Conservation was held at CPRI, Bengaluru on 27th November 2023. The competition was well attended by both Group A and B participants with a participation of 50 students in Group A and 48 students in Group B. The Prize Distribution Ceremony was held at S J Auditorium, CPRI, Bengaluru. Prizes were distributed to the winners of both A & B Category.

Painting Competition Winners - Category A

Painting Competition Winners - Category B

SECTION - 6

CONFERENCES / SEMINARS/ WORKSHOPS / WEBINARS/ SPECIALISED TRAINING PROGRAMMES

TRAINING ACTIVITIES & PROGRAMMES

The phenomenal growth in the Indian Power Sector over past few years has magnified the need for absorption of latest technology in all the three spheres of Power Sector activity viz. Generation, Transmission, and Distribution. Coupled with this is the paucity of trained technical personnel and or skilled manpower.

Recognizing this need of the Indian Power Sector, CPRI has been in the forefront amongst many Training Institutes to disseminate the knowledge, assimilated by way of in-house research, through technical training programmes organized for:

- Upgrading the working skills of the Power Sector employees
- Training of personnel from Utilities/ Industries/ Clientele from Companies in the Power Sector in relevant skill for their day to day activities.

Constant efforts are being put up by CPRI in training and continuing education schemes, from basic theoretical knowledge to practical hands-on training in electrical systems. Training Programmes and Courses conducted by CPRI are well designed and have made substantial impact on the confidence level of the engineers actually working on the systems, by way of changing their thought process while working. The training modules are so designed to comprehensively address the specific need of the Power Sector Utilities and have benefitted large number of employees from Indian Electrical Equipment Manufacturers, Generation, Transmission and Distribution Companies for the past several years. The training courses help the technical personnel / engineers by upgrading their occupational skills and improve their performance. This has led to the overall improvement in the efficiency in performance and competitiveness of the Indian Electrical Industry as a whole.

Conferences/ Seminars/ Workshops/ Webinars/ Specialized Training Programmes organised by CPRI during the year 2023-24

Sl. No	CONFERENCES / SEMINARS/ WORKSHOPS / WEBINARS/ SPECIALISED TRAINING PROGRAMMES
1	Nine days Residential Training Programme for M/s. WBSETCL, held at CPRI, Bangalore
2	Seven days Residential Training Programme for M/s. WBSETCL held at CPRI, Bangalore
3	Nine days Residential Training Programme for M/s. WBSETCL held at CPRI, Bangalore
4	Eight Days Residential Training Programme for M/s. WBSETCL held at CPRI, Bangalore
5	Twenty days Residential Training Programme for M/s. WBSEDCL held at CPRI, Bangalore
6	Training Program on "Condition Assessment of Inter Connecting Transformer (ICT) through offline and online test - Including Online Acoustic Emission Technique for Measurement of Partial Discharge and other defects in ICTs" – online and offline at site for the officials of M/s. Power Grid, 400/200kV, Mysore Substation – at site
7	Training Program on "Diagnosis of Transformer – Online & Offline Tests on Shunt Reactors / Transformers" – online and offline at site for the officials of M/s. PGCIL, 400/220kV Substation, Hassan, Karnataka– at site

Sl. No	CONFERENCES / SEMINARS/ WORKSHOPS / WEBINARS/ SPECIALISED TRAINING PROGRAMMES
8	Training Program on “Condition Assessment of Shunt Reactor (80MVAR) using Online Acoustic Emission Technique and other Diagnostic Techniques” at site for officials of M/s. Power Grid Corporation of India Limited., SRTS-II 400/230kV, Karaikudi Substation-at site
9	Training Programme on “Condition Monitoring/Condition Assessment of Generator Transformers – at site – Offline-Online Techniques” for officials of M/s. YTPS-RPCL-Yeramaus, Raichur, Karnataka
10	Training Programme on “Benefits of Periodic Diagnosis and Condition Monitoring of HV Equipments at site” for O&M Engineers & Technical Staffs of M/s. NHPC, Rangit Power Station, Rangit Nagar, South Sikkim
11	Webinar on “Draft Indian standard for onsite diagnostic testing of power transformers for condition/health assessment”
12	Training programme on “Laying and Bonding of EHV Cable System” for KPTCL Engineers at 110kV, Belagavi Substation, during Pre-Commissioning tests on 110kV Cable System at site
13	On-site Training Programme on “Condition Monitoring and Diagnostics tests on Generators” for the officials of M/s. NHPC, Chamera Power Station I, Himachal Pradesh
14	5 days Residential Training Program on “Analysis of PCB Samples using GC” for the Engineers of M/s. Steel Authority of India Ltd., Bhilai Steel Plant, Bhilai held at CPRI, Bengaluru
15	3 days Residential Training Program on “Analysis of PCB Samples using GC” for the engineers of M/s. Re Sustainability Ltd., Bhilai held at CPRI, Bengaluru.
16	Training Program on “Condition Monitoring of Transformers using Oil Analysis” for the Engineers of M/s. KSEB, Pallom, Kottayam
17	Training programme on “Conditioning Monitoring of Transformers by DGA Furan and D.P Test” for the Engineers of M/s. NMDC Nagarnar, Chhattisgarh at site
18	Training programme on “Conditioning Monitoring of Transformers by DGA Furan and D.P Test” for the Engineers of M/s. NMDC Nagarnar, Chhattisgarh at site
19	Training programme on “Conditioning Monitoring of Transformers through Transformer oil testing” for the Engineers of M/s. NALCO Smelter Plant, Angul Odisha at site
20	Awareness Programme on PCB dechlorination work for the Engineers of M/s. KSEB, Pallivasal Power House, Idukki
21	Webinar on “Conditioning monitoring of Transformers using oil analysis” for the Engineers of M/s. Druk Green Power Corporation Limited (DGPCL), Bhutan
22	Training Program on "Environmentally Sound Management of Polychlorinated Biphenyls containing Transformer Oils in India" for the Engineers of M/s. KSEB, Sabarigiri Power House, Kerala
23	Workshop on “Significance of Ingress Protection and Testing Modalities”
24	Workshop on “Battery and Battery energy storage System-Present and Future”

Sl. No	CONFERENCES / SEMINARS/ WORKSHOPS / WEBINARS/ SPECIALISED TRAINING PROGRAMMES
25	Workshop on Solar PV Modules, Solar Inverters and Solar Power Plant held at CPRI, Bengaluru
26	Training program on “Performance assessment of Cooling Towers” at JNSTPP, Nigrie, M.P
27	Training program on “Energy Audit at Thermal Power Station” for officials of Chandrapur STPS, Maharashtra
28	Training Programme on “Energy Audit” for officials of Parli TPS, Maharashtra
29	Training Programme on “Energy Audit” for officials of Paras TPS, Maharashtra
30	Webinar on “Vibration & Seismic testing of Equipment” for M/s. nVent Electrical Products India Pvt Ltd, Ramanagara
31	Webinar on “Vibration & Seismic testing of Equipment” for M/s. K K Wind Solutions India Pvt Ltd, Bangalore
32	One-Day Workshop cum stakeholder meeting on “High Voltage Test facility” held at CPRI, Bengaluru
33	Webinar on “Dielectric Testing of Instrument & Power Transformer”
34	Webinar on “Best Grounding practices”
35	Webinar on “Standard Codes for Dielectric Tests In High Voltage Equipment”
36	National Conference - "ARCON2024” with the theme "Internal Arc – Causes and Effects: A Panoramic View" held at CPRI, Bengaluru
37	Webinar on “Testing Methodologies of Power and Distribution Transformers”
38	Webinar on “Making and Breaking Phenomena in Circuit Breakers”
39	Workshop on the topics - “About CPRI - The activities/ Test facilities” and “Assessment of Boiler Water Wall tubes” held at M/s. NTPC Kaniha, Talcher Odisha
40	Webinar on “Cybersecurity in Digital Substation” for M/s. Sarla Advantech Pvt. Ltd, Mumbai
41	Webinar on “Cybersecurity in Energy Sector” for the employees of M/s. NHPC, Corporate office, Faridabad and NHPC Hydro Power Stations
42	Webinar on “IT-OT Convergence in Hydro Power Station” for the employees of M/s. NHPC, Corporate office and Officers & Executives from M/s. NHPC Power station
43	Webinar on “Cybersecurity Risk Assessment for PLCs, DCS and SCADA System” for the employees of M/s. NHPC, Corporate office, Faridabad and NHPC Hydro Power Stations
44	National Webinar on “Smart Grid Cybersecurity”
45	Webinar on “NIST Cyber security Framework” for the employees of M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
46	Webinar on “Cybersecurity for the Future Electric Grid” for the employees of M/s NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
47	Webinar on “Smart Grid Standardization Roadmap”

Sl. No	CONFERENCES / SEMINARS/ WORKSHOPS / WEBINARS/ SPECIALISED TRAINING PROGRAMMES
48	Webinar on “Cyber Security in the OT Environment: Enhancing Protection” for M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
49	Webinar on “ISMS Compliance Audit and OT Cybersecurity Compliance Audit” for the employees of M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
50	Webinar on "Global Cybersecurity incidents in Power Sector” for the employees of M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
51	Webinar on “CEA Guidelines for Cybersecurity in Power Sector 2021” for the employees of M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
52	Webinar on “Hydroelectric Cybersecurity Response and Recovery” for the employees of M/s. NHPC, Corporate Office, Faridabad and NHPC Hydro Power Stations
53	National Conference on “Smart Grid, Smart Meter, Communication Technologies and Cyber Security” held at CPRI, Bangalore
54	Webinar on “OT Cybersecurity”
55	National Conference on “Latest Developments in Design & Testing of Transmission Line Towers/Poles & its Accessories” held at CPRI, Bangalore
56	Webinar on 'Generator protection' for the Engineers of M/s. IOCL
57	Webinar on 'Substation protection' for the Engineers of M/s. IOCL
58	Webinar on 'Testing of numerical IEDs' for the Engineers of M/s. IOCL
59	Workshop on “Generator Protection” for the Engineers of M/s. NHPC Ltd., Loktak, Manipur
60	Workshop on “Testing of Numerical Relays” for the Engineers of M/s. NHPC Ltd., Loktak, Manipur
61	Workshop on “Generator Protection” for the Engineers of M/s. IOCL,
62	Workshop on “Substation Protection” for the Engineers of M/s. IOCL
63	Workshop on “Testing of Protection Relays” for the Engineers of M/s. IOCL
64	Online Brainstorming Session on “Technical Challenges Faced by the Power Sector”
65	Workshop on “Cyber Security Initiatives in the Power Sector”
66	Webinar on “Testing and Analysis of Transmission Line Equipments and Accessories”
67	Webinar on “Condition Monitoring of Power Transformer: evaluation of liquid and solid insulation condition using National/International Standards”
68	Webinar on “Latest Trends and Developments in Low Voltage Switchgear, Control gear and Associated Assemblies”
69	Webinar on “Testing Requirements of Combined Metering Unit as per Latest Standard and its Mutual Influences”
70	Webinar on “Temperature rise test requirement for LT & HT Switchgear & Control gear Equipment with failure analysis”
71	Webinar on “Advanced Metering Infrastructure Systems and Technologies”

Sl. No	CONFERENCES / SEMINARS/ WORKSHOPS / WEBINARS/ SPECIALISED TRAINING PROGRAMMES
72	National Webinar on "Cyber Security for Power Sector"
73	Webinar on "IEC 61850 Technologies and Conformance testing"
74	Webinar on "Power System SCADA and Automation"
75	Webinar on "Testing and Certification of Switchgear as per IEC Standards"
76	Webinar on "Testing of MCB and RCCB as per new standards"
77	Webinar on "Emerging Trends in Metering Technologies"
78	Webinar on "Innovation and Best Practices in Transformer Design, Testing and Maintenance"
79	Webinar on "EMI/EMC Test on Smart Devices"
80	Webinar on "Dielectric Performance of HV & LV Electrical Equipments"
81	Webinar on "Testing and certification of distribution Transformer as per IS 1180"
82	Webinar on "Thermal & Electro Technical Calibration"
83	Webinar on "Testing and Evaluation of Instrument Transformers"
84	Webinar on "Sampling and testing of dielectric oil as per latest standards"
85	Workshop on "Condition Assessment of RCC Foundation of Boiler Auxiliaries ID Fan, FD Fan, PA Fan, and Bowl mills" held at M/s. NTPC Limited, Singrauli Super Thermal Power Station, Singrauli
86	Webinar on "Testing and Evaluation Techniques of UHV Equipment"
87	Webinar on "Preventive Maintenance of Transformers through Transformer oil Testing"
88	Webinar on "Methods for improvement of Partial Discharge on High Voltage Apparatus"

SECTION - 7

CAPITAL PROJECTS

CAPITAL PROJECTS

During the FY 2023-24, CPRI is executing the following Capital Projects:

1. XII Plan Project
2. DIB Project
3. Common Test Facility (CTF) at Manufacturing Zone, Narmadapuram

XII Plan Project

Capital project with an outlay of Rs. 996.10 Crores comprising of two project components titled (i) "Augmentation of High Power Short Circuit Test facilities by installation of two Additional 2500 MVA Generators and associated equipment-Outlay Rs.640.00 Crores" and (ii) "Establishment of New Test Facilities-Outlay Rs.356.10 Crores" under the 12th Five Year Plan, was approved as one project proposal by Finance Ministry & MoP vide order No.5/5/2014-T&R dated 5th January 2015 & is under implementation from April 2015.

The details of the Ongoing XII plan projects/schemes are given in the table below:

Sl. No	Title of the Proposal	Cost (Rs. in Crores)
I	**"Augmentation of High Power Short Circuit Test facilities by installation of two Additional 2500 MVA Generators and associated equipment" under XII Plan**	
(i)	Augmentation of High Power Short Circuit Test facilities by installation of two Additional 2500 MVA Generators with associated equipment at High Power Laboratory, CPRI, Bengaluru.	509.00
II	**'Establishment of New Test Facilities' under XII Plan Proposals'**	
(i)	Establishment of 40 kA continuous current Temperature Rise test Facility at HPL, CPRI, Bengaluru	15.00
(ii)	Establishment of Total Test Facility for Transformers at CPRI Western Zone	216.14

Establishment of 40 kA Temperature Rise Test Facility

The 40 kA Temperature Rise Test Facility at the Central Power Research Institute (CPRI) in Bangalore, established under XII Plan Capital Project, is a specialized setup designed to conduct temperature rise tests on electrical equipment, particularly focusing on medium-voltage bus ducts and related components. This facility has been established to accommodate tests for equipment with continuous current ratings of up to 40,000 A, ensuring rigorous evaluation under operational conditions.

Salient Features of the Lab:

- The setup can handle continuous current for extensive testing durations, essential for determining the thermal behaviour of electrical components under load conditions.
- The facility is designed to meet various national and international standards, ensuring that the tested

equipment is compliant with industry requirements.

- It supports testing of various electrical apparatus, ensuring their reliability and performance under high current conditions, which is critical for safety and operational integrity in power systems.

DIB Project

- DIB proposal for Augmentation of existing Test Facilities & Establishment of New Test Facilities at various centers of CPRI, was approved by Ministry of Power, New Delhi, with an outlay of Rs. 213.40 Crore vide Letter No.5/1/2021-T&R dated 21st January 2022.

Sl. No	Project Component	CPRI Units at	Total Cost (Rs. in Crores)
01	Test facilities for Smart Meters, RTUs, and IEDs including cyber security tests.	Bhopal, Hyderabad, Noida, Raipur, Nashik, Bangalore	76.40
02	a) Test facilities for Routine tests, Impulse Test and Temperature Rise Test on Distribution Transformers	Hyderabad, Noida, Raipur	16.00
	b) Setting up of 10/350 micro second Impulse Current Test Facility	Bangalore	16.00
03	Augmentation of Test Facilities Related to Instrument Transformers, Insulators and Power Transformers.	Hyderabad	65.00
04	Modernization of Existing Synthetic test facility at High Power Laboratory, Bengaluru	Bangalore	40.00
		Total	**213.40**

- Energy Meter Test Laboratory with state-of-the art high precision test facilities for carrying out Routine Tests, Acceptance Tests and DLMS compliance tests as per National and International Standards was established at CPRI, UHVRL- Hyderabad under DIB Projects. Few Photographs of this facility are placed below:

6 Position Energy Meter Test Bench Setup

AC & DC Magnet Test Setup

DLMS Compliance Test Setup

Common Test Facility (CTF) at Manufacturing Zone, Narmadapuram

Setting up of manufacturing zone for power and Renewable energy equipment at Mohasa Babai industrial area, District Narmadapuram, M.P.

Joint Scheme by MNRE and MoP

- MNRE and MoP launched a pilot scheme for establishing Manufacturing Zones for Power and Renewable Energy Equipment.
- Aim is to develop manufacturing based on clean and energy-efficient technologies.
- Minimize dependency on imported equipment, critical components, and spares.
- Promote "Make in India" and "Atmanirbhar Bharat."
- Foster indigenization of imported items.
- Set up exclusive Manufacturing Zones with easy land allotment, clearances, and competitive facilities.

- Lower manufacturing costs, boosting domestic competitiveness and self-reliance.
- Optimize resources and benefit from economies of scale.

Approval for Manufacturing Zone in Madhya Pradesh

- Ministry of Power has approved the establishment of a Manufacturing Zone for Power and Renewable Energy Equipment in Madhya Pradesh.
- **MPIDC will set up the zone in Mohasa Babai Industrial Area, District Narmadapuram.**

Role of CPRI

CPRI has been entrusted with the responsibility of establishing a Common Test Facility (CTF) for power equipment at the Manufacturing Zone. This facility aims to support the testing and validation of equipment, ensuring quality and reliability in the power sector.

Status of CPRI's Involvement

- A comprehensive business proposal with a financial outlay of ₹93.23 crore, covering the development of test facilities for cables and batteries, has been submitted by CPRI to the Ministry of Power (MoP). This proposal has been duly approved by the MoP.
- A Memorandum of Understanding (MoU) has been signed between CPRI and MPIDCL to the establishment of the CTF.
- Procurement activities for the test facilities will be managed by CPRI, while the civil works associated with the project will be executed by MPIDCL.
- CPRI has already submitted the necessary civil drawings to MPIDCL for the commencement of construction activities.

SECTION - 8

ADMINISTRATIVE MATTERS

ADMINISTRATIVE MATTERS

Governance

The following distinguished persons have joined the Governing Council and the Society of CPRI as members in 2023-24:

1. Shri Mahabir Prasad, Joint Secretary & Financial Adviser, MoP
2. Shri Koppu Sadashiv Murthy, Chairman & Managing Director, BHEL
3. Shri R K Tyagi, Chairman & Managing Director, Power Grid Corporation of India Ltd.,
4. Shri Rajesh Kumar Singh, Secretary, Ministry of Commerce & Industry, Dept. of Industrial Policy & Promotion.
5. Shri P.C.Meena, I.A.S, Managing Director, Dakshin Haryana Bijli Vitran Nigam Ltd., (DHBVN)
6. Shri Hamza Arsiwala, President- IEEMA

The following distinguished persons joined the Standing Committee of CPRI as Members in 2023-24:

1. Shri Mahabir Prasad, Joint Secretary & Financial Adviser, MoP

Details of Governing Council and the Standing Committee meetings of CPRI held during the year 2023-24:

1. 90th CPRI Governing Council Meeting and 46th Annual General Meeting was held through Virtual Mode, on 05th December 2023.
2. 91st Meeting of CPRI Governing Council was held through Virtual Mode, on 15th January 2024.
3. 92nd Meeting of CPRI Governing Council was held through Virtual Mode, on 16th February 2024.
4. 88th Meeting of CPRI Standing Committee was held through Virtual Mode, on 19th October 2023.

Important Events

- Parliamentary Standing Committee on Energy (2023-24) visited CPRI, Bengaluru on 04th November 2023. Honorable Chairman and Members reviewed the performance of CPRI and unveiled the portraits of Dr. B. R. Ambedkar and preamble of the Constitution.

Visit of Parliamentary Standing Committee on Energy (2023-24)

- The fifth meeting of Steering Committee for National Mission on use of Biomass in coal based thermal power plants was held under the Chairmanship of Secretary, Ministry of Power at Shram Shakti Bhawan, New Delhi, on 24th July 2023.
- The first, second and third meeting of the Technical Scoping Committee of National Mission on Advanced and High Impact Research (MAHIR) was held under the chairmanship of Chairperson, CEA, through video conferencing mode on 25th July 2023, 08th December 2023 & 25th January 2024, respectively.
- Progress of the on-going R&D Project titled "Characterization and utilization of paddy straw and other agro-residues for conversion into pellets for co-firing in thermal power plants (TPP)" (taken up under SAMARTH mission) under execution at ICAR-CICOT was reviewed through on-site visit by the SG-1 members on 28th August 2023.
- The fifth Executive Committee meeting of National Mission on use of Biomass in Thermal Power Plants (SAMARTH) was held under the chairmanship of Member-Thermal, CEA, through video-conferencing mode, on 21st September 2023.
- The ninth meeting of the Sub-Group-1 under National Mission on use of Biomass in coal fired Thermal Power Plants was held on 10th January 2024.

Meeting of Technical Committees of Research

- Meeting of the Technical Committee on Thermal Research was held on 10th August 2023, 24th August 2023, 19th October 2023 & 15th February 2024.
- Meeting of the Technical Committee on Hydro Research was held on 22nd August 2023 & 14th February 2024.
- Meeting of the Technical Committee on Transmission Research was held on 21st September 2023, 22nd September 2023, 28th February 2024 & 29th February 2024.
- Meeting of the Technical Committee on Grid, Distribution and Energy Conservation Research was held on 05th October 2023, 06th October 2023 & 26th February 2024.
- The 29th Meeting of the Standing Committee on Research & Development (SCRD) was organized under the Chairmanship of Chairperson, CEA, through Video Conferencing mode, on 14th March 2024.

Signing of MoUs

- A Memorandum of Understanding (MoU) was signed between Ministry of Power & Central Power Research Institute on the key performance parameters proposed for the financial year 2023-24, on 12th December 2023.
- CPRI signed a MoU for research and academic collaboration with IIT Mandi, on 09th September 2023. The scope of the MOU covers collaborative R&D, academic interaction leading to higher qualifications and other programs to benefit students and staff of both the organizations. A photograph is placed below:

Activities Related to Women Employees

The Women's Cell looks after:

- Welfare of the women employees of the organization
- Addresses the issues/ grievances concerning women employees and facilitates redressal of the same
- Manages the Creche in CPRI colony and provides necessary guidelines for its smooth functioning

The internal complaints committee of Women's cell investigates reported cases of sexual harassment of women in CPRI and submits its report to the disciplinary authority by recommending action to be taken against the accused employees. This is carried out as per the CPRI's Internal Policy for Prevention, Prohibition and Redressal of Sexual Harassment of Women at Workplace. The women's cell also looks into any other complaints by Women employees in workplace. The committee consists of five members from CPRI and one external member.

The crèche at CPRI is open for employee's kids and is housed in CPRI colony. It is managed by women's cell with support of CPRI management and with two caretakers. Felicitations were arranged by the Women's cell to superannuating women of the institute during the year.

International Women's Day was celebrated on 11th March 2024 at CPRI. Dr Medha Y Rao, Dean Academics, Ramaiah University of Applied Sciences, Bengaluru was the Chief Guest of the function and delivered the talk on "Work Life Balance and Issues faced by Women at Work Place".

Photograph of the function is given below:

Statement indicating total number of employees in the Institute and number of women in each category as on 31st March 2024

Sl. No.	Post(s)	No. of employees	No. of women employees	Percentage of women employees
1	Director General	1	-	-
2	Director	0	-	-
3	Additional Director	18	3	16.67
4	Joint Director	40	8	20.00
5	Chief Accounts Officer (SG)	1	-	-
6	Chief Administrative Officer (OG)	1	-	-
7	Scientists/Engg Officers	123	13	10.57
8	Scientists/Engg Assistants	71	4	5.63
9	Non-Tech Officers	12	4	33.33
10	Office Staff/Stenographer	60	25	41.67
11	Library staff	1	1	100.00
12	Technicians	84	-	-
13	Technical Attendant/Attendant	43	4	9.30
14	Drivers/Cook-cum-care taker	6	-	-
15	Multi-Tasking Staff	23	3	13.04
	Total	**484**	**65**	**13.43**

Staff Strength of the Institute as on 31st March 2024

Sl. No.	Posts	No. of employees
1	Director General	1
2	Director	0
3	Additional Director	18
4	Joint Director	40
5	Chief Accounts Officer (SG)	1
6	Chief Administrative Officer (OG)	1
7	Scientific/Engg. Category	194
8	Technicians	84
9	Administrative & Supporting Staff	102
10	Supporting Technical Staff	43
	Total	**484**

Vigilance Activities

Observance of the "Vigilance Awareness Week 2023" commenced with administering "Integrity Pledge" to all the employees of Head Office and Units on 30th October 2023.

As directed by the Commission, banners on "Vigilance Awareness Week" were displayed at prominent locations in Head Office and at all the Units of CPRI.

- Background of the theme of Vigilance Awareness week -2023 was displayed on the web page of CPRI and hyperlink for Integrity Pledge was provided in CPRI website.
- The employees of CPRI who were newly recruited took e-pledge using the hyperlink provided in the website.
- Posters on PIDPI issued by CVC were displayed on Notice Boards in all Units/ Divisions/ Sections/ Labs and also mailed to all the employees of the Institute.
- Several competitions were organized by the Institute to the students of KV Hebbal school, Bengaluru to create awareness among the students on the theme "Say no to corruption; commit to the Nation; भ्रष्टाचार का विरोध करें; राष्ट्र के प्रति समर्पित रहें". The prize amount was distributed to the students who participated and won in the Competitions.

- An Essay Competition was conducted for the employees of CPRI, Bengaluru, on the central theme of Vigilance Awareness Week-2023 i.e. "Say no to corruption; commit to the Nation; भ्रष्टाचार का विरोध करें; राष्ट्र के प्रति समर्पित रहें", on 10th November 2023.
- Few lecture programmes were organized during the campaign period (16th August 2023 – 15th November 2023) to Vigilance Awareness Week 2023. The details are as under:

  * On 19th October 2023 – On Vigilance viewpoint, inculcating moral values of honesty, integrity, probity and ethical behavior among employees. Dr. (HC) Shyam Kumar P.K., CEO and Founder of Inner Truth delivered the lecture.

* On 08th November 2023 – Induction programme for newly recruited employees and on CCS Conduct Rules on Vigilance point of view to the employees of CRTL-Bengaluru. Shri S.K. Srivastava, Chief Administrative Officer (Retd.), DRDO delivered the lecture.

- Observance of the "Vigilance Awareness Week" was concluded on 16th November 2023, with an invited talk by Shri Satishchandra Jha, Deputy Superintendent of Police of Central Bureau of Investigation (Anti-Corruption Bureau), Bengaluru Branch, who was also the Chief Guest for the concluding function. The programme was organized at S.J. Auditorium, CPRI, Bengaluru. The Chief Guest in his address emphasized to build a prosperous and fair nation, and it is imperative to take a stand against corruption and work together to create a future where honesty, integrity and the common good prevail. In this commitment lies the promise of a better tomorrow for all. The Officers/ Officials of the Institute at Headquarters attended the function.

• Vigilance Cases

Nil

Information on Right to Information Act

CPRI has Right to Information (RTI) cell to respond RTI applications and the RTI cell consists of CPIO, APIO & Appellate Authority under the Ministry of Power. The nominated RTI cell office bearer during 2023-24 are Dr. P. Thomas, Additional Director as Appellate Authority, Dr. Amit Jain, Additional Director as Central Public Information Officer and Shri. G. Kishore Kumar, Joint Director as Central Assistant Public Information Officer.

The sumoto disclosure of the organization information is uploaded in web site of CPRI (www.cpri.res.in) under the RTI act 2005, section 4 with all the details of staff, organization and updated on daily, monthly and quarterly basis.

The data on no. of applications received and replies sent to applicants during the year 2023-2024 i.e., from 01.04.2023 to 31.03.2024 is given below:

No. of Applications received	Total Directly received applications	Applications forwarded by MoP	Applications forwarded by others	Applications transferred to other departments	Applications Rejected under the various clauses of section-8 RTI
78	64	7	7	1	1

All the RTI applications responded by RTI cell is within the specified period.

Liaison Officer for SC/ST & PWD Welfare Activities

Activities relating to Liaison Officer SC/ST & PWD & OBC Welfare Activities:

Shri Gurudev T, Joint Director and Shri T Mallikharjuna Rao, Additional Director, CPRI, Bengaluru served as Liaison Officers for SC/ST & PWD and OBC categories respectively during the year 2023-24. Reservation registers and Roster registers were updated for the year 2023-24.

Representation of Scheduled Caste, Scheduled Tribe & OBC as on 31st March 2024:

Group	Total	SC	ST	OBC	Others
A	167	42	14	38	73
B	178	25	22	44	87
C	116	17	12	36	51
MTS	23	9	3	2	9
Total	484	93	51	120	220
Percentage	-	19.21	10.54	24.79	45.45

Representation of Physically Challenged Employees as on 31st March 2024

Sl. No.	Post(s)	No. of employees	No. of physically challenged employees	Percentage of physically challenged employees
1	Director General	1	-	-
2	Director	0	-	-
3	Additional Director	18	-	-
4	Joint Director	40	-	-
5	Chief Accounts Officer (SG)	1	-	-
6	Chief Administrative Officer (OG)	1	-	-
7	Scientists/Engg Officers	123	3	2.44
8	Scientists/Engg Assistants	71	3	4.23
9	Non-Tech Officers	12	-	-
10	Office Staff/Stenographer	60	4	6.67
11	Library staff	1	-	-
12	Technicians	84	-	-
13	Technical Attendant/Attendant	43	4	9.30
14	Drivers/Cook-cum-care taker	6	-	-
15	Multi-Tasking Staff	23	-	-
		484	14	2.89

Public & Staff Grievance Cell

Central Power Research Institute has a separate cell for redressing the staff and public grievances. The Grievance Redressal Mechanism is a part and parcel of the machinery of CPRI Administration. The role of Public and Staff Grievance Cell is primarily to assist the management in redressing the Staff and Public grievance petitions. The grievance received by the Cell are forwarded to the concerned Section/Division who are dealing with substantive function linked with the grievance for redressal under intimation to the complainant. The complaints are either received in person, by post, Fax, e-media or through online CPGRAMS portal. CPRI web portal has direct link to CPGRAMS portal www.CPGRAMS.IN. The CPGRAMS offers to the staff and public the facility of lodging online grievances, on-line reminders and online view of current status of the grievances. The guideline indeed is that CPRI deals with every grievance in a fair, objective and just manner. The monitoring of grievances received and disposed of by CPRI under Public & Staff Grievances Cell is on a regular basis.

During the year 2023-24, CPRI has redressed 15 grievance petitions from online grievance portal. No other grievances received from other means (through letter, email, fax, RTI etc.). Grievance petitions received from the ex-employees and general public on matters related to pension, recruitment and new innovative ideas under Research & Developments. Suggestions, comments made by the general public have been appreciated and replied.

Summary of online grievances received and disposed:

Grievance Source	B/F Balance	Receipt During the Period	Total Receipts	Cases Disposed of During the Period	Closing Balance as on 31/03/2024	Yet to Assess	At our Office
DARPG	0	0	0	0	0	0	0
Local/Internet	2	6	8	8	0	0	0
Pension	0	1	1	1	0	0	0
PMO	2	5	7	6	1	0	0
Total	4	12	16	15	1	0	0

CPRI Library and Information Centre, Bengaluru

The Library and Information Centre is a specialized facility dedicated to serving the needs of Electrical and Power Engineering. It is located in the centre of the campus with a floor area of 720.10 square meters.

The Institute has a modern Library with a vast collection of over 65,691 documents which offers a diverse range of resources, including technical books, reports, standards, CD-ROMs, Hindi literature, fiction, audio-visual educational cassettes, and back volumes of journals.

To enhance accessibility and user experience, the Library provides Computer facilities with internet connectivity. Additionally, the Library offers a dedicated Wi-Fi facility for laptop users, while ensuring the security of premises with CCTV web cameras.

The KOHA Library Management System automates essential operations such as acquisition, circulation and cataloguing. The Library also features a Knowledge Management System portal for archiving digital documents and standards.

The Institute has established various amenities for the patrons of Library, including a Web Online Public Access Catalogue (Web OPAC) for effortless resource searching, a Knowledge Management portal, an e-resource browsing area, and a designated laptop zone equipped with Wi-Fi connectivity.

In the year 2023-24, the Library has expanded its collection with the addition of 191 documents, encompassing IEC, ASTM, BSI, ISO standards and other publications. The total number of Library cardholders is 177. In the year 2023-24, the Library acquired 51 Hindi books, 40 Swamy's books and 5 technical books. The Library purchased six books on Ambedkar's life to commemorate Ambedkar Jayanti. In addition, users generously donated 33 books to the Library. The Library has subscribed to nineteen Indian and five International journals and newspaper subscriptions in multiple languages including Hindi, English and Kannada. Moreover, the Library has secured annual subscriptions to CIGRE Collective Membership, IEEE Xplore Digital Library Enterprise Level 1, World Energy Council and CBIP Life membership, the complete set of the Bureau of Indian Standards and a Grammarly Premium subscription to aid the users.

The Library and Information Centre is committed to continuously enhancing library services and resources to ensure that users always have access to the most up-to-date information in a conducive environment for research and learning.

SECTION - 9

FINANCE & ACCOUNTS

FINANCE & ACCOUNTS

The Institute has done well in its financial performance during the year 2023-24 and earned revenue of Rs. 227.23 Crores

Revenue earnings during the past five years

Year	Revenue (Amount in Crores)
2023-2024	227.23
2022-2023	179.26
2021-2022	131.39
2020-2021	149.39
2019-2020	160.08

During the year under report, as against the revenue billed of Rs.22,722.53 lakhs, the expenditure on revenue activities stood at Rs.21,859.35 lakhs resulting in a surplus of Rs.863.17 lakhs. For the 35th year in succession, the Institute has not drawn any Revenue Grant-in-Aid from the Government of India.

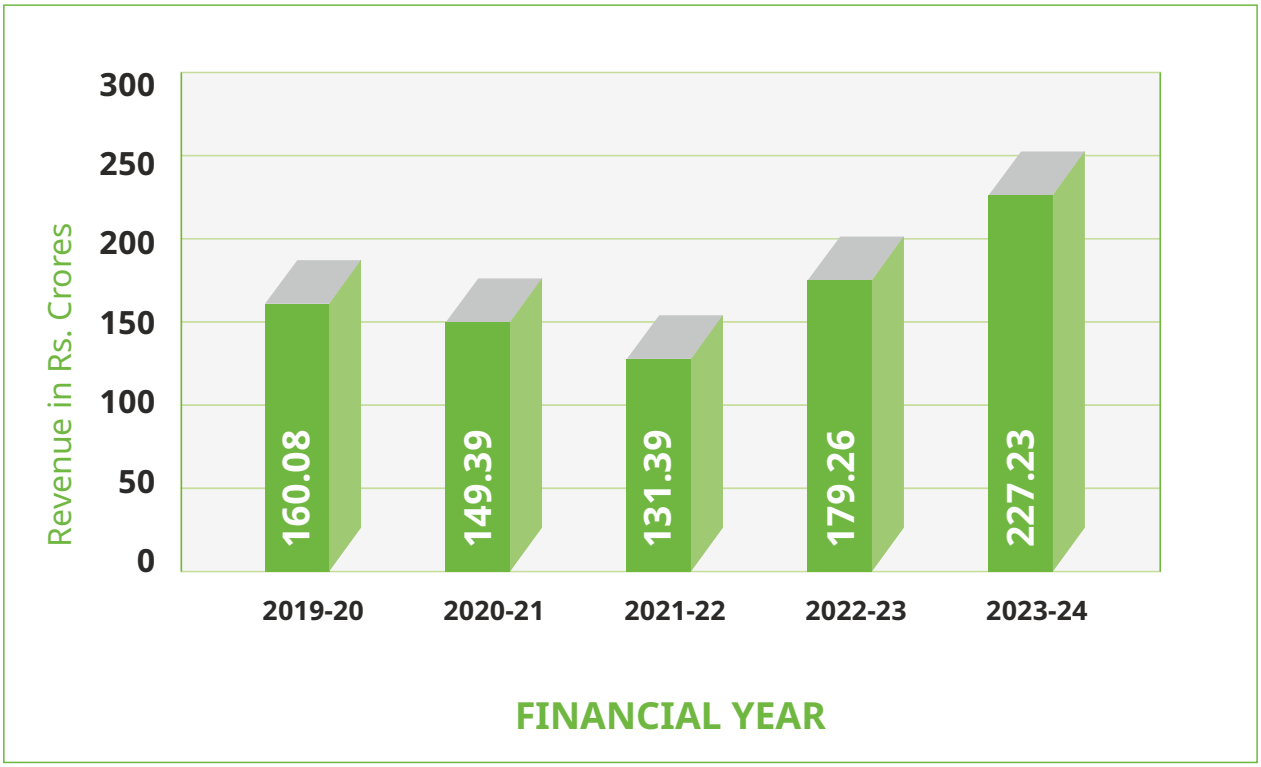
During the year, the expenditure under various heads has been as follows:

Revenue	Rs. 21,859.35 lakhs
Plan Capital	Rs. 16,975.65 lakhs
R & D Schemes: IHRD	Rs. 88.43 lakhs
RSoP	Rs. 1,137.28 lakhs
NPP	Rs. 729.44 lakhs

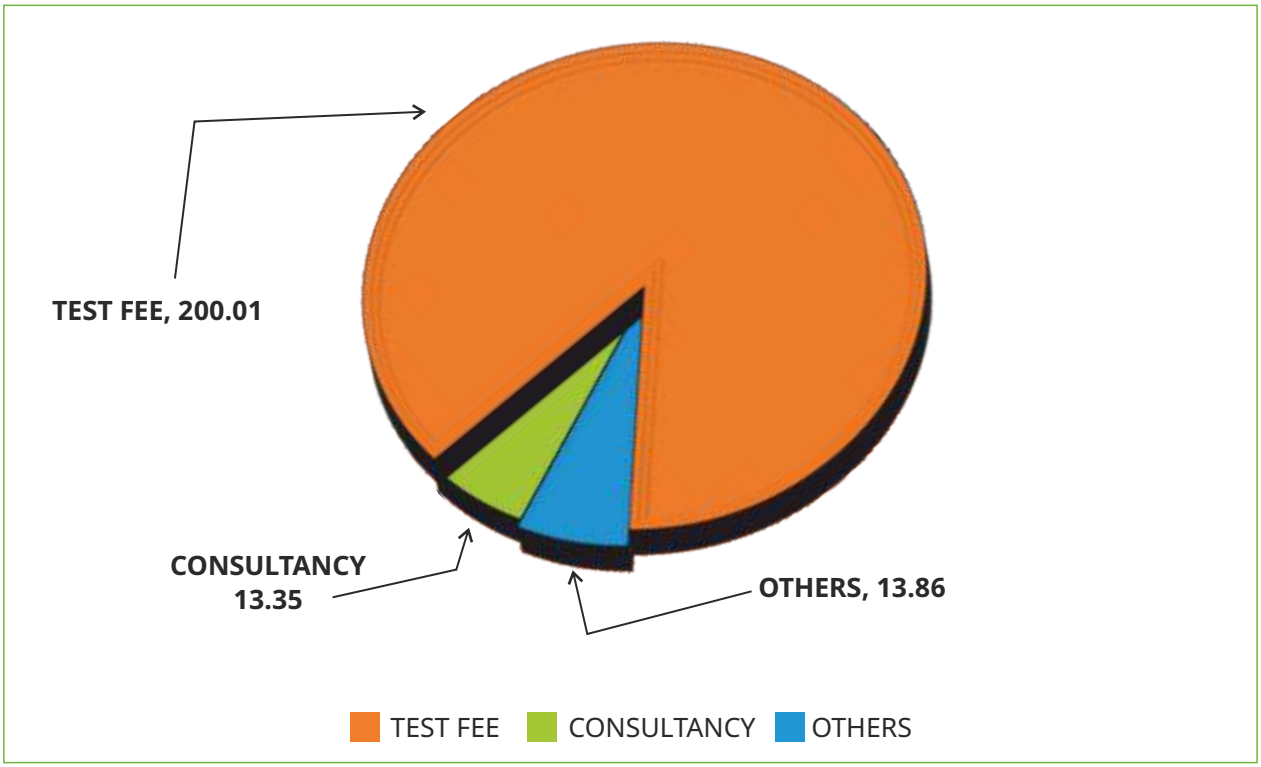
The Institute received grants-in-aid for Creation of Capital Assets of Rs.14,395.14 lakhs from the Government of India during the year. The details along with Auditors Report are furnished in Section 11.

As at the end of March 2024, the capital investment by the Government of India on the Institute has been Rs.1,47,495.61 lakhs.

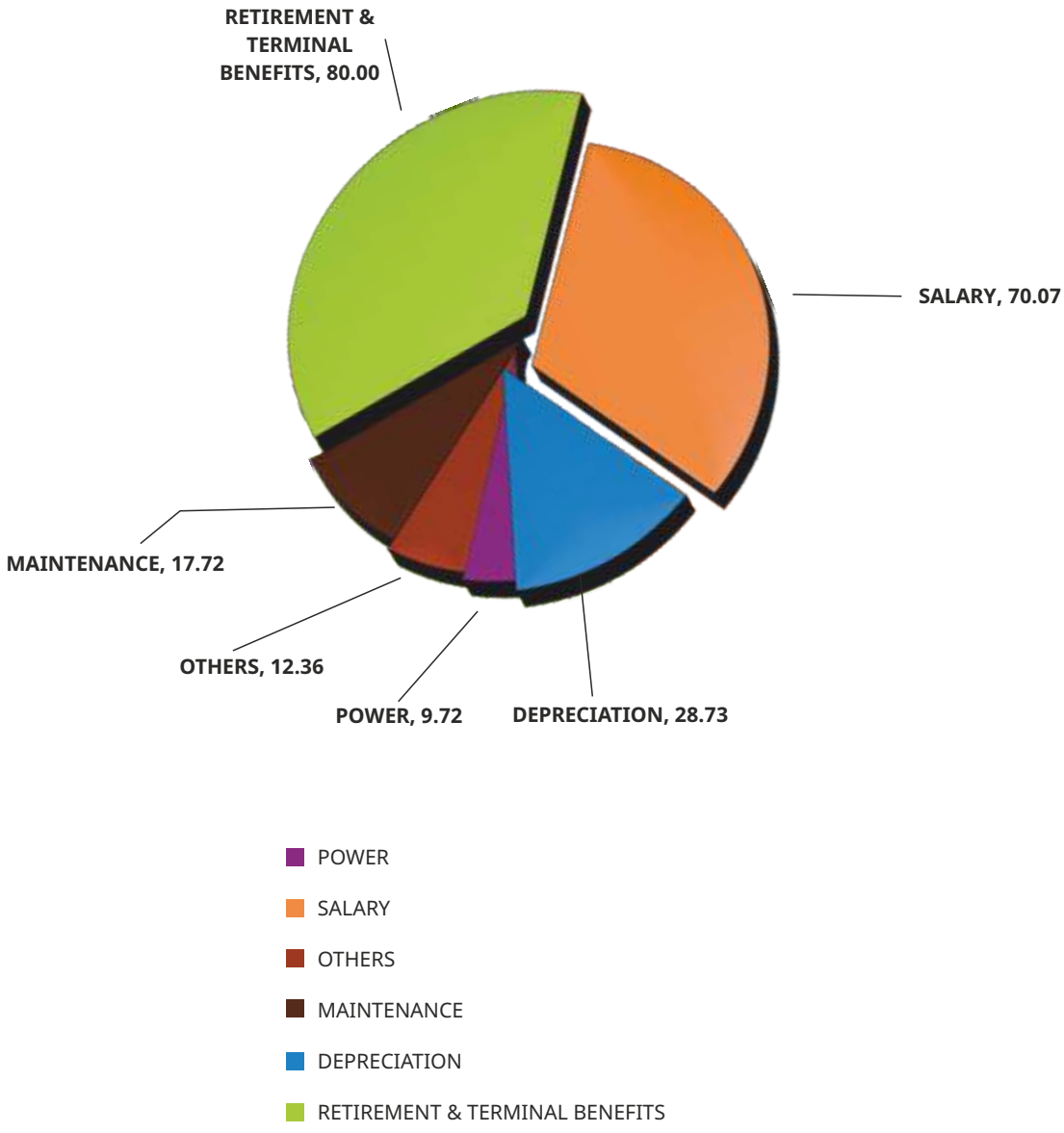
REVENUE EARNINGS DURING THE PAST FIVE YEARS (Rs. in Crores)



REVENUE EARNED DURING 2023-24 UNDER MAJOR HEADS (Rs. in Crores)



EXPENDITURE DURING 2023-24 UNDER MAJOR HEADS (Rs. in Crores)



SECTION - 10

ACTIVITIES IN OFFICIAL LANGUAGE

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ACTIVITIES IN OFFICIAL LANGUAGE: HINDI

Remarkable achievements of the Institute in the field of Official Language Implementation during the year 2023 – 24 are listed below:

1. AWARD

- **TOLIC Rajbhasha Shield (Second)**

Central Power Research Institute was awarded TOLIC Rajbhasha Shield - Second for the Excellent performance in the implementation of the Official Language during the year 2022– 23, which was given by the Chairman, TOLIC during the second meeting of TOLIC held at CMTI, Bangalore on 12th January 2024. The photograph is placed below:

2. Inspection

Deputy Director from Regional Implementation Office (South), Bangalore inspected the Institute, on 06th September 2023. The required questionnaire was prepared in this regard. During the Inspection, the Deputy Director discussed about the progress of official language implementation in the Institute. He appreciated the activities of the Institute for achieving the targets as per the annual programme.

Thereafter, the Deputy Director addressed the Heads of all the Divisions/Sections and Laboratories, under the chairmanship of the Director General and briefed everyone about the Kanthasth 2.0 version. A photograph is placed below:

3. Hindi Workshop

a) Workshop on "Kanthasth 2.0"

An online workshop on "Kanthasth 2.0" was conducted by TOLIC, Thiruvananthapuram on 14th February 2024. Shri Rajesh Kumar Srivastava, Deputy Director (Official Language and Technology), Ministry of Home Affairs, Govt. of India was the faculty. The link for the workshop was made available by TOLIC and the same was forwarded to all the Officers and Employees of CPRI. Many people took advantage of this workshop.

b) Workshop on "Technical Writing in Hindi"

An Online workshop on "Technical Writing in Hindi" was organized for all the Officers and Employees of CPRI on 15th December 2023. The speaker was Shri Saurabh Mandal, Scientist. F, Centre for Artificial Intelligence and Robotics (CAIR), Bangalore.

4. Conferences

a) Regional Official Language Conference

Joint Regional Official Language Conference of South and South Western Regions was organized at Hindustan Aeronautics Limited, Academy of Management, Sanjay Nagar, Bengaluru, on behalf of Department of Official Language, Ministry of Home Affairs, New Delhi, on 19th January 2024. Union Minister of State for Home Affairs Shri Ajay Kumar Mishra was the chairperson of the Conference. Shri Ramjeet Singh, Additional Director, Smt. L.N. Vidya, Sr. Hindi Officer and Dr. Shamla Medhar, Sr. Hindi Translator participated in the Conference. Photographs are placed below:

b) All India Official Language Conference

Shri Pankaj Dawle, Engineering Officer Grade 1 from CPRI, TRC-Nagpur and Smt. Vidya Raj, Junior Hindi Translator from CPRI, STDS-Bhopal participated in the All India Official Language Conference held at Pune on 14th & 15th September 2023. A Photograph is placed below:

5. Hindi Advisory Committee's Meeting

Hindi Advisory Committee's Meeting of the Ministry of Power was held under the Chairmanship of Shri R.K. Singh, Honorable Union Minister of Power and New and Renewable Energy, on 17th August 2023 at New Delhi. The Director General and Senior Hindi Translator attended the meeting.

6. Training

All the Ministerial employees of the institute, i.e. 37 employees, were nominated for Parangat classes. The classes have commenced from 04th January 2024.

7. Publications

a. Annual Report

The Annual Report of the institute for the year 2022-23 was published in bilingual.

b. CPRI News

CPRI Urja Anusandhan - The Quarterly magazine of CPRI was published in bilingual.

c. Rajbhasha Samachar

Eighth issue of the annual magazine – Rajbhasha Samachar was brought out which depicts the achievements of Official Language in the Institute.

d. STDS Darpan

23rd issue of the House magazine - STDS Darpan of STDS, Bhopal was brought out during the year.

8. Hindi Month & Hindi Divas

Hindi Maah was celebrated from 04th September 2023. Under Hindi Maah, competitions like Hindi essay, Hindi song, Translation, Crossword, News reading, Quiz and Antakshari were conducted, which were held separately for the Officers / Employees who possess working knowledge and also proficiency in Hindi. Prizes and Certificates were distributed to all the prize winners. Under the incentive scheme, Cash Prizes and Certificates were distributed to 9 employees under the original Noting and Drafting competition in Hindi. Cash prizes and Certificates were also given to the winners of three excellent articles written in Hindi under Technical Articles competition.

Hindi Divas Celebration

Hindi Divas was celebrated on 15th September 2023 at CPRI, Bangalore.

Hindi Divas Celebration

9. Facility of Hindi in all computers

The work of re-installation of Unicode has been completed in each and every computer of all the Divisions/Sections/Labs of the Institute. Along with this, Google input tool has also been installed in order to facilitate everyone to type in Hindi using phonetic keyboard and all the employees have been given training in this regard.

10. Activities of Town Official Language Implementation Committee

a) The first meeting of TOLIC-II was held on 04th August 2023 at Atomic Mineral Exploration and Research, Bangalore. Shri Ramjeet Singh, Additional Director and Dr. M. Shamla, Senior Hindi Translator participated in the meeting.

b) The second meeting of TOLIC-II was held on 12th January 2024 at CMTI, Bangalore. Shri B. A. Sawale, Director General, Shri Ramjeet Singh, Additional Director, Smt. L.N. Vidya, Senior Hindi Officer and Dr. M. Shamla, Senior Hindi Translator participated in the meeting.

c) Smt. Sahodar Gade, Engineering Officer Gr.3 represented the Institute in the technical seminar in Hindi organized at GPO, Bangalore on 04th September 2023.

d) Senior Hindi Officer and Senior Hindi Translator participated in the meeting for Official Language Officers and Liaison Officers held at GPO, on 18th December 2023.

e) Under the aegis of TOLIC-II, Bengaluru, the Institute organized and sponsored a Crossword Puzzle competition under Inter organizational competitions for all the member offices on 06th October 2023. Officers and employees from around 35 offices participated in this competition.

f) The officers and employees of the Institute also participated in the competitions organized by other organizations under TOLIC- II, Bangalore.

11. Other Activities

a. Learn " a word - a day" Scheme

Boards are installed at the Main Gate of the Institute and at the entrance of the Head Office. Two staff members of the Institute have been provided with the administrative terminology sent by the Commission for Scientific and Technical Terminology, with the help of which a Hindi word with its English meaning is being written on these boards every day by the employees specified for this work.

b. Learn "Ten words a Month" Scheme

Under "Learn and use Ten Hindi words per month scheme", Ten Hindi words with their English equivalents are released every month and all the employees are requested to use these words in their day-to-day official work during that month.

c. Tenders in Bilingual

All the Notice Inviting Tenders, E-Tenders, Corrigendum, Addendum, Notice Inviting Quotation etc. from Civil Engineering Division, Mechanical Engineering Division, Purchase Section etc. are issued and published in bilingual in Newspapers. Also, they are uploaded on the CPRI website simultaneously.

d. Advertisements in Bilingual

All the Advertisements relating to Posts are being issued in bilingual and also published in Newspapers in bilingual. They are also uploaded on the CPRI website simultaneously.

12. Website

The website of the Institute www.cpri.res.in is available in Bilingual and is being updated from time to time.

13. Supply of Forms

Three kinds of forms (Hindi / Hindi–Kannada/ Hindi–English) are used in the Institute and are uploaded in CPRI Website.

i. 64 different types of forms are available in Bilingual.

ii. Only Hindi forms are issued to employees possessing the working knowledge of Hindi.

iii. Hindi-Kannada forms are also made available.

14. English-Hindi Phrases and Notings printed on folders

The file folders used in the Institute contain 40 English-Hindi Phrases and 40 English-Hindi Notings printed on each side so that every employee who does desk work can easily access the ready reckoner list of Hindi Phrases and Notings.

SECTION - 11

AUDITORS REPORT & BALANCE SHEET

V.K. Niranjan & Co.
Chartered Accountants

Phone : 080 - 2335 7769
Mobile : +91 87624 42895
E-mail : reachus@vknca.com

INDEPENDENT AUDITOR'S REPORT

To,
The Governing Council
Central Power Research Institute
Bangalore.

Report on the financial statements

Opinion

We have audited the accompanying financial statement **of CENTRAL POWER REASEARCH INSTITUTE** ("the Institute"), which comprise the balance sheet as at March 31, 2024, the Income and Expenditure Account for the year then ended of the Institute for the year thereto and a summary of significant accounting policies and other explanatory information.

In our opinion, except for the effect on the financial statements of the matters described in the basis for **Emphasis of matter** paragraph, the financial statements have been properly prepared.

a. In the case of the Balance sheet, of the state of the affairs of the Institute as at March 31,2024. And

b. In the case of the Income and Expenditure Account, of the excess of income over expenditure for the year ended as at that date.

Basis for Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs). Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the Code of Ethics issued by the Institute of Chartered Accountants of India together with the ethical requirements that are relevant to our audit of the financial statements and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our **opinion**.

1049, "Maria Arcade" Dr. Rajkumar Road, 4th 'M' Block, Rajajinagar, Opp. SJR High School, Bengaluru - 560010
Branch : Hyderabad

In our opinion and to the best of our information and according to the explanations given to us, except for the effects of the matter described in the Emphasis of Matter section of our report, the aforesaid financial statements give a true and fair view in conformity with the accounting principles generally accepted in India, of the state of affairs of the Institute as at March 31st, 2024 and its excess of income over expenditure for the year ended as on that date

Emphasis of Matter

We draw attention to the following in Schedule No. 3 & Schedule No. 7 of the financial statements

a) CPRI has invested Superannuation fund with M/s LIC of India to the extent of Rs.934.25 crores for the year ended 31.03.2024 with current year provision as Rs. 80 crores. CPRI has received two Actuarial Valuation reports as follows:

a) Estimation received from M/s Transvalue Consultants is ₹. 1066.65 crores.
b) Estimation received from M/s LIC of India is ₹.730.90 crores

Hence the surplus for the year has been overstated ₹ 132.40 crores (as per M/s Transvalue Consultants valuation) and excess provision made as per M/s LIC of India.

Our opinion is not modified in respect of this matter.

Responsibility of Management and those charged with Governance for the financial statements.

The Management of the Institute is responsible for the preparation of the financial statements in accordance with the generally accepted accounting principles in India. This responsibility includes the design, implementation and maintenance of internal controls relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatements, whether due to fraud or error.

Auditor's Responsibility for the audit of Financial Statement

Our responsibility is to express an opinion on these financial statements based on our audit. We have conducted our audit in accordance with the standards on auditing issued by the Institute of Chartered Accountants of India (ICAI).

Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessments of the risks of material misstatement of the financial statements whether due to fraud or error.

In making those risk assessments, the auditor considers internal controls relevant to the Institute's preparation and fair presentation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the Institute's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the management, as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our qualified audit opinion of the Financial Statements.

Report on other Legal and Regulatory Requirements

As required by Societies Registration Act and applicable statutes we report that:

a)) We have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit except for the information stated in "Emphasis of matters" paragraph
b) In our opinion, proper books of account as required by law have been kept by the Institute so far as it appears from our examination of those books
c) The Balance Sheet, the Statement of Income and dealt with by this Report are in agreement with the books of account

For **V.K.Niranjan & Co.,**
Chartered accountants
ICAI Firm Regn. No.: 002468S

Place: Bengaluru
Date: 19-08-2024

(Niranjan V.K.)
Partner
Membership No: **021432**
UDIN: 24021432BKDHKU7015

CENTRAL POWER RESEARCH INSTITUE, BANGALORE

BALANCE SHEET AS AT 31ST MARCH 2024

(Amount in Rs.)

Capital Fund and Liabilities	Schedule	Current Year	Previous Year
Capital Reserve representing Assets acquired from Grant-in-Aid from Government of India and Others	1	15,90,21,24,780	14,10,99,75,062
Reserves and Surplus	2	99,43,74,456	98,53,08,880
Earmarked and Endowment Funds	3	14,16,27,05,981	12,73,87,33,900
Grants from Government of India	4	1,71,69,74,060	2,16,56,88,363
Current Liabilities and Provisions	5	1,55,84,38,285	1,25,73,25,104
TOTAL		**34,33,46,17,562**	**31,25,70,31,309**
Assets			
Fixed Assets	6	15,60,55,37,121	13,81,33,87,403
Investments from Earmarked & Endowment Funds	7	12,88,88,68,386	11,82,11,26,965
Current Assets, Loans and Advances	8	5,84,02,12,055	5,62,25,16,941
TOTAL		**34,33,46,17,562**	**31,25,70,31,309**
Significant Accounting Policies	16		
Notes on Accounts & Contingent Liability	17		

Schedules 1 to 8 and 16 & 17 form part of Balance Sheet

As per Our Report of Even Date
for V.K.Niranjan & Co.,
Chartered Accountants
FRN:002468S

Bangalore	**(C.S. Murali Krishna)**	**(B.A. Sawale)**	**(Niranjan V.K.)**
19-08-2024	Chief Accounts Officer	Director General	Partner
			Membeship No. 021432

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2024

(Amount in Rs.)

INCOME	Schedule	Current Year	Previous Year
Income from Test Fee & Consultancy	9	213,36,64,153	158,13,99,450
Fees	10	1,37,94,608	1,46,57,952
Interest Earned	11	9,54,68,761	13,62,41,699
Other Income	12	2,93,25,387	6,03,39,006
TOTAL (A)		**227,22,52,909**	**179,26,38,107**
EXPENDITURE			
Research Establishment Expenses	13	150,06,86,981	111,43,06,703
Research Administrative Expenses	14	37,79,85,555	35,53,65,212
Depreciation and Provision for doubtfull debts	15	30,72,62,999	29,67,83,272
TOTAL (B)		**218,59,35,535**	**176,64,55,187**
Balance being excess of Income over Expenditure (A-B)		8,63,17,374	2,61,82,920
Add:			
Opening Balance of General Reserve Account		5,99,87,242	4,36,07,577
Assets (Revenue) acquired transferred to Capital Reserve		68,79,118	98,03,255
CLOSING BALANCE OF GENERAL RESERVE		**13,94,25,498**	**5,99,87,242**
Significant Accounting Policies	16		
Notes on Accounts & Contingent Liability	17		

Schedules 9 to 15 and 16 & 17 form part of Income & Expenditure Account

As per Our Report of Even Date
for V.K.Niranjan & Co.,
Chartered Accountants
FRN:002468S

Bangalore
19-08-2024

(C.S. Murali Krishna)
Chief Accounts Officer

19/8/24

(B.A. Sawale)
Director General

19/8/2024

(Niranjan V.K.)
Partner
Membership No. 021432

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

	SCHEDULE - 1	Current Year		Previous Year	
	CAPITAL RESERVE REPRESENTING ASSETS ACQUIRED FROM GRANT-IN-AID FROM GOVT. OF INDIA AND INTERNAL RESOURCES				
a)	Under Non-recurring Grant-in-Aid	1240,74,26,034		1091,44,36,140	
	Addition during the year	169,75,65,284		146,52,97,894	
	Transferred from CPRI Revenue	-		2,76,92,000	
			1410,49,91,318		1240,74,26,034
b)	Under Non-recurring Grant-in aid (For M/s. NHPTL Equity Capital)	24,00,00,000		24,00,00,000	
	Addition during the year		24,00,00,000	-	24,00,00,000
c)	Under R&D Schemes	39,23,62,729		40,54,06,984	
	Less: Re-classification	-		1,69,07,263	
	Addition during the year	96,55,904	40,20,18,633	38,63,008	39,23,62,729
d)	Assets Acquired out of RSoP & NPP Management Fund	25,51,283		25,51,283	
	Addition during the year	-	25,51,283	-	25,51,283
	Sub Total (A)		1474,95,61,234		1304,23,40,046
	ASSETS ACQUIRED FROM INTERNAL RESOURCES				
e)	Under Non-recurring Grant-in aid (CPRI's 10% Contribn.)	19,26,13,358		25,41,27,491	
	Addition during the year	7,23,13,173		54,85,867	
	Transferred To CAPITAL WIP	-		6,70,00,000	
			26,49,26,531		19,26,13,358
f)	Under Revenue	27,23,71,250		29,02,59,996	
	Less: Re-classification	-		2,76,92,000	
	Addition during the year	68,79,118	27,92,50,368	98,03,254	27,23,71,250
g)	Under Revenue (Equity Participation)	6,40,00,000		6,40,00,000	
	Addition during the year		6,40,00,000	-	6,40,00,000
h)	Assets Acquired out of General Reserve	8,54,61,298		8,54,61,298	
	Addition during the year		8,54,61,298		8,54,61,298
i)	Assets Acquired out of Sponsored Schemes	39,87,81,519		36,88,05,706	
	Addition during the year	57,36,239	40,45,17,758	2,99,75,813	39,87,81,519
j)	Capitalisation of Assets acquired out of Loan	4,89,94,808	4,89,94,808	4,89,94,808	4,89,94,808
k)	Surplus on sale of Asset	54,12,783		54,12,783	
	Addition during the year		54,12,783	-	54,12,783
	Sub Total (B)		1,15,25,63,545		1,06,76,35,016
	TOTAL (A+B)		**15,90,21,24,780**		**14,10,99,75,062**

Place : Bangalore,
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

	SCHEDULE 2	Current Year		Previous Year	
	RESERVES AND SURPLUS				
A	**GENERAL RESERVE**				
	As per last Account	5,99,87,242		4,36,07,577	
	Add: Surplus during the year	8,63,17,374		2,61,82,920	
	Less: Assets (Revenue) acquired transferred to Capital Reserve	68,79,118		98,03,255	
	Net Balance A		**13,94,25,498**		**5,99,87,242**
B	**Reserve for Capital Expenditure out of CPRI generated funds**				
	Opening Balance	89,22,86,642		83,07,72,509	
	Less: Provision reversed during the year	-		-	
	Less: Utilisation during the year	7,23,13,172		6,15,14,133	
	Net Balance B		**81,99,73,470**		**89,22,86,642**
C	**MAINTENANCE, RENEWAL & OBSOLESCENCE RESERVE**				
	Opening Balance	3,20,65,612		3,42,77,571	
	Add: Interest earned	21,74,733		20,51,145	
	Less: Utilisation during the year	-		42,63,104	
	Sub Total	**3,42,40,345**		**320,65,612**	
	Add: Security Deposit	7,35,143		9,69,383	
	Net Balance C		**3,49,75,488**		**3,30,34,996**
	TOTAL (A+B+C)		**99,43,74,456**		**98,53,08,880**

Place : Bangalore
Date: 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

	SCHEDULE 3:	Current Year		Previous Year	
	EARMARKED & ENDOWMENT FUNDS:				
A	**SUPERANNUATION FUND**				
	Opening Balance	726,18,24,115		681,18,24,115	
	Less: Re-classification of Additional Interest earned	-		-	
	Add: Contribution during the year	80,00,00,000		45,00,00,000	
	Add: Interest Transferred for Utilisation	43,38,90,547		44,70,79,711	
	Less: Utilisation for Pension payments	43,38,90,547		44,70,79,711	
	Sub Total	**806,18,24,115**		**726,18,24,115**	
	Add: Retention Money Security Deposit	39,30,403		15,69,020	
	Add: Interest Earned	58,06,95,743		51,48,95,054	
	Less: Interest Transferred for Utilisation	43,38,90,547		44,70,79,711	
	Additional interest for the year	14,68,05,196		6,78,15,343	
	Opening Balance of Additional Interest	113,39,20,493		106,61,05,150	
		128,07,25,689		**113,39,20,493**	
	Net Balance - A		**934,64,80,207**		**839,73,13,628**
B	**PROVIDENT FUND**				
	Opening Balance	39,20,68,573		41,86,17,269	
	Add: Subscriptions & Repayments	5,62,66,130		6,31,35,885	
	Add: Interest Credited to PF subscribers	2,57,10,887		2,54,52,155	
	Less: Final Settlement Withdrawals	4,01,83,934		7,94,18,424	
	Less: Withdrawals	3,85,41,642		3,57,18,312	
	Sub Total	**39,53,20,014**		**39,20,68,573**	
	Add: Balances under Security Deposit etc.,	79,454		79,454	
	Opening Balance (Additional Interest)	5,09,15,101		4,85,04,373	
	Add: Additional Interest earned (Excess of Interest Paid over Interest earned Rs.3,18,16,501 - Rs.2,68,46,141)	49,68,360		24,10,728	
	Total	**5,58,83,461**		**5,09,15,101**	
	Net Balance - B		**45,12,82,929**		**44,30,63,128**
C	**NEW PENSION SCHEME FUND**				
	(i) Opening Balance (Employee's Contribution)	-		24,920	
	Add: Interest on Employees' Contribution (cumulative)	-		18,678	
	(ii) Opening Balance (Employer's Contribution)	-		24,919	
	Add: Interest on Employer's Contribution (cumulative)	-		18,878	
	Sub Total	-		**87,595**	
	Add: Additional Interest earned	-		2,06,107	
	Add: Balances under Security Deposit etc.,	-		16,782	
	Net Balance - C		-		**3,10,484**
D	**DEPRECIATION FUND**				
	Opening Balance	371,07,97,102		322,20,18,195	
	Add: Depreciation During the year	28,72,62,999		27,67,83,272	
	Sub Total	399,80,60,101		349,88,01,467	
	Add: Interest earned	23,77,46,069		26,14,50,370	
	Less: Utilization During the year	6,53,71,022		4,94,54,736	
	Add: Payables to CPRI	1,00,00,000		-	
	Net Balance - D		**418,04,35,148**		**371,07,97,102**
E	**OTHER FUNDS**				
	(i) Sponsored Scheme Deposits		11,35,63,302		10,91,91,141
	(ii) IHRD Scheme Deposits		7,09,44,395		7,80,58,418
	TOTAL (A+B+C+D+E)		**1416,27,05,981**		**1273,87,33,904**

Place: Bangalore
Date: 19-06-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

		SCHEDULE 4	Current Year		Previous Year	
		GRANTS FROM GOVT. OF INDIA, & OTHERS				
A		Under Non-recurring Grant-in aid				
		Opening Balance	216,46,82,450		202,52,15,108	
		Add: Grant received during the year	124,39,99,050		160,47,65,236	
		Less: Grant utilised during the year	169,75,65,284		146,52,97,894	
		Grant Balance		171,11,16,216		216,46,82,450
B		Under R&D Schemes Grant-in-Aid				
	(i)	Under IHRD Schemes				
		Opening Balance	-		13,60,517	
		Add: Grant received during the year	88,43,000		2,73,42,037	
		Less: Grant utilised during the year	88,43,000		2,87,02,554	
		Grant Balance		-		-
	(ii)	Under RSoP Scheme				
		Opening Balance	-		67,74,000	
		Add: Grant received during the year	11,37,28,000		5,53,42,720	
		Less: Grant utilised during the year	11,37,28,000		6,21,16,720	
		Add: Unspent balance received from executing agencies	58,56,844		10,04,913	
		Less: Grant refunded to M o P during the year	-		-	
		Grant Balance		58,56,844		10,04,913
	(iii)	Under NPP Scheme				
		Opening Balance	1,000		2,82,21,000	
		Add: Grant received during the year	7,29,44,000		6,21,54,243	
		Less: Grant utilised during the year	7,29,44,000		9,03,74,243	
		Less: Grant refunded to M o P during the year	-		-	
		Add: from IHRD	-		-	
		Grant Balance		1,000		1,000
		TOTAL		**171,69,74,060**		**216,56,88,363**

Place : Bangalore
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

		SCHEDULE 5	Current Year		Previous Year	
		CURRENT LIABILITIES AND PROVISIONS				
I		CURRENT LIABILITIES				
1		Sundry Creditors				
		i) For Supplies & Services	(33,58,651)		88,24,520	
		ii) For Expenses	12,59,34,285		3,17,90,479	
		iii) For Salaries	5,70,13,036		4,94,50,834	
		iv) For Others	7,72,01,794		7,51,96,663	
		v) Interest received on Grant Account to be refunded to M o P	1,56,34,123		34,73,932	
				27,24,24,587		16,87,36,428
2		Deposits Received		90,55,49,198		87,91,15,239
3		Statutory Liabilities		2,63,76,027		2,42,41,889
4		EMD, Security Deposits and others		31,36,40,463		16,52,31,548
5		Reserve for Doubtful debts		2,29,63,010		2,00,00,000
II		PROVISIONS		1,74,85,000		-
		TOTAL		**155,84,38,285**		**125,73,25,104**

Place: Bangalore

Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

	SCHEDULE 6	GROSS BLOCK						
	FIXED ASSETS	Cost/valuation As at beginning of the year	Additons during the year (Non-Plan)	Additons during the year (RC-Project)	Transfer from WIP (CPRI)	Transfer from WIP (MOP)	As at the Current year end	As at the Previous year end
A	FIXED ASSETS:							
1	LAND:							
	Freehold	6,96,84,860					6,96,84,860	6,96,84,860
2	BUILDINGS ON FREEHOLD LAND	148,17,07,024				(6,47,85,636)	141,69,21,388	148,17,07,024
3	PLANT MACHINERY &	711,95,17,936	67,05,008	96,55,904		11,57,43,081	725,16,21,929	711,95,17,936
4	VEHICLES	55,81,762					55,81,762	55,81,762
5	FURNITURE, FIXTURES	3,35,95,447	1,74,110				3,37,69,557	3,35,95,447
6	LIBRARY BOOKS & FILM	1,57,10,525				93,13,888	2,50,24,413	1,57,10,525
7	MACHINERY & EQUIPMENTS (SPONSERED PROJECTS)	39,87,81,518		57,36,239			40,45,17,757	39,87,81,518
	TOTAL (A)	912,45,79,072	68,79,118	1,53,92,143	-	6,02,71,333	9,20,71,21,666	9,12,45,79,072
B	CAPITAL WORK-IN-PROGRESS	460,77,94,783	169,75,65,284			(6,03,48,136)	624,50,11,931	460,77,94,783
	CAPITAL WORK-IN-PROGRESS (CPRI GRANT	8,10,13,548	7,23,13,173			76,803	15,34,03,524	8,10,13,548
	TOTAL (B)	4,68,88,08,331	176,98,78,457	-	-	(6,02,71,333)	6,39,84,15,455	4,68,88,08,331
	GRAND TOTAL	1381,33,87,403	1,77,67,57,575	1,53,92,143	-	-	1560,55,37,121	1381,33,87,403

Place : Bangalore,
Date: 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

	SCHEDULE 7		Current Year	Previous Year
	INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS			
A	**SUPERANNUATION FUND INVESTMENT ACCOUNT**			
	1	Investment in LIC of India, under Superannuation Scheme	8,51,79,78,634	792,95,13,341
	2	Claims Receivable	-	-
	3	Cash at Bank (S.B. Account No.10356553751)	2,75,87,913	1,68,49,855
		Total - A	**854,55,66,547**	**794,63,63,196**
B	**PROVIDENT FUND INVESTMENT ACCOUNT**			
	1	In Government Securities	3,64,92,938	3,64,92,938
	2	Bonds	-	30,95,00,000
	3	Term Deposits with Banks & Financial Institutions	29,95,00,000	7,00,00,000
	4	Interest Accrued on Provident Fund Investments	122,00,102	128,61,879
	5	TDS Receivables	62,26,244	45,91,889
	6	Receivable from HO & CRTL	-	-
	7	Cash at Bank (S.B. Account No.10356553740)	9,68,63,645	96,16,422
		Total - B	**45,12,82,929**	**44,30,63,128**
C	**NEW PENSION SCHEME FUND INVESTMENT ACCOUNT**			
	1	Deposit with Bank	-	2,81,335
	2	Accrued Interest on NPS Deposit	-	29,149
		Total - C	**-**	**3,10,484**
D	**DEPRECIATION FUND INVESTMENT ACCOUNT**			
	1	Term Deposits with Banks & Financial Institutions	3,31,12,14,782	2,41,98,77,349
	2	Bonds	9,00,00,000	66,05,00,000
	3	Interest Accrued on Depreciation Fund Investments	37,87,54,561	31,41,74,356
	4	Margin Money Deposit	-	51,00,000
	5	Bank balance	8,70,43,999	2,70,84,341
	6	TDS recevables	2,50,05,568	46,54,111
			3,89,20,18,910	**3,43,13,90,157**
	Total (A+B+C+D)		**12,88,88,68,386**	**11,82,11,26,965**

Place : Bangalore
Date : 19-08-2024

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CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Balance Sheet as at 31st March 2024

(Amount in Rs.)

		SCHEDULE 8	Current Year		Previous Year	
		CURRENT ASSETS, INVESTMENTS, LOANS & ADVANCES				
A		**CURRENT ASSETS:**				
	1	**Inventories:**				
		a) Stores and Spares		9,70,819		6,20,764
	2	**Sundry Debtors:**				
		a) Debts Outstanding for a period exceeding six months	25,53,86,697		35,76,43,867	
		b) Debts Outstanding for a period not exceeding six months	8,29,05,109	33,82,91,806	3,83,79,620	39,60,23,487
	3	**Cash balances in hand (including cheques/drafts, Imprest and Stamps)**		3,98,652		3,30,173
	4	**Deposits and Bank Balances:**				
		a) Margin Money Deposits on R&D, SPON & Revenue	3,00,31,722		1,90,08,000	
		b) Margin Money Deposits on Grant account	1,63,87,49,708		1,97,27,13,164	
		c) Deposits earmarked for Superannuation Fund	80,00,00,000		45,00,00,000	
		d) Deposits earmarked for Depreciation Fund	28,72,62,999		27,67,83,272	
		f) Capital Bank Balance	13,11,92,180		4,58,95,077	
		g) Savings Accounts	50,43,76,840	3,39,16,13,449	13,78,52,233	2,90,22,51,746
	5	**Deposits of Maintenance, Renewal & Obsolescence Reserve**	3,40,00,000		3,40,00,000	
		Add: Savings Bank account of Maintenance, Renewal & Obsolescence Reserve	44,820		2,55,495	
		Add: Accrued Interest on MRO Fund & TDS Receivable, etc.,	56,84,036	3,97,28,856	35,31,706	3,77,87,201
B	1	**Investments**				
		a) Investment in Shares of Joint Venture Company, M/s National High Power Test Laboratory Pvt Ltd., New Delhi		30,40,00,000		30,40,00,000
		b) Long Term Deposits with Banks	23,75,96,201		58,91,31,594	
		Margin Money with Banks against BG	2,74,33,870		3,75,33,120	
		Short Term Deposits with Banks	52,55,15,628	79,05,45,699	42,48,07,785	105,14,72,499
C		**LOANS, ADVANCES & OTHER ASSETS**				
		a) i) Deposits with Govt.Depts & others	2,33,89,656		2,62,34,806	
		ii) Deposits with Revenue Authorities (Payment under Protest)	6,70,59,191		6,68,17,271	
		b) Advances to Employees	12,33,193		20,07,343	
		c) Prepaid Expences	4,38,992		8,13,082	
		d) Accrued Interest	19,82,16,786		20,52,52,887	
		e) TDS Receivables	15,55,13,749		10,74,35,907	
		f) Claims Receivables & Statutory Liabilities	22,60,28,431		21,77,58,297	
		g) Capital Advances	10,05,34,169		10,05,34,169	
		h) Other Advances	1,82,46,607		1,91,77,309	
		i) Deposit to NHPTL	18,40,00,000	97,46,62,774	18,40,00,000	93,00,31,071
		TOTAL		**584,02,12,055**		**562,25,16,941**

Place : Bangalore
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

	SCHEDULE 9	Current Year	Previous Year
	INCOME FROM TEST FEE & CONSULTANCY		
a)	**Test Fee**	200,01,49,369	144,69,61,667
b)	**Consultancy Services Charges**	13,35,14,784	13,44,37,783
	TOTAL	**213,36,64,153**	**158,13,99,450**

Place : Bangalore,
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

	SCHEDULE 10	Current Year	Previous Year
	FEES		
a)	**Training Fee**	69,27,000	1,31,52,000
b)	**Seminar Fee**	68,67,608	15,05,952
	TOTAL	**1,37,94,608**	**1,46,57,952**

Place : Bangalore,
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

	SCHEDULE 11	Current Year	Previous Year
	INTEREST EARNED		
a)	**Interest on Term Deposits with Banks & Financial Institutions**	10,42,16,533	10,14,42,200
b)	**Interest on Deposit with Others**	(95,79,937)	3,37,66,804
c)	**Interest on Loans & Advances to Employees**	8,32,165	10,32,695
	TOTAL	**9,54,68,761**	**13,62,41,699**

Place : Bangalore,
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

		SCHEDULE 12	Current Year	Previous Year
		OTHER INCOME		
1)		**Fees for Miscellaneous Services**		
	a)	Sale of Publications	2,000	8,000
	b)	Library Receipts	100	100
2)		**Miscellaneous Income**		
	a)	Application fee on recruitment	39,66,106	8,13,402
	b)	Sale of Tender forms	59,600	14,500
	c)	Licence fees	21,53,803	16,05,127
	d)	Rent Receipts	23,42,329	15,81,551
	e)	Sale of Scrap	55,89,125	46,74,163
	f)	Others	74,31,094	2,34,62,771
	g)	Interest Received on Income Tax Refunds	77,81,230	2,43,20,766
	h)	Provision for Doubtful Debts Realised	-	38,58,626
		TOTAL	**2,93,25,387**	**6,03,39,006**

Place : Bangalore,
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

	SCHEDULE 13	Current Year	Previous Year
	RESEARCH ESTABLISHMENT EXPENSES		
a)	Salaries and Wages including Bonus	66,52,82,695	63,57,29,544
b)	Staff Welfare Expenses	1,53,16,730	1,40,45,689
c)	Expenses on Employee's Retirement and Terminal Benefits	80,00,00,000	45,00,00,000
d)	Expenses on Medical Facilities	2,00,87,556	1,45,31,470
	TOTAL	150,06,86,981	111,43,06,703

Place: Bangalore,
Date : 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

	SCHEDULE 14	Current Year	Previous Year
	RESEARCH ADMINISTRATIVE EXPENSES		
a)	Electricity and Power	9,72,03,033	9,03,08,333
b)	Water Charges	5,91,587	6,37,323
c)	Office Expenses	7,78,89,886	5,79,31,363
d)	Repairs and Maintenance	17,72,22,632	18,22,87,345
e)	Rent, Rates and Taxes	12,99,848	13,98,647
f)	Vehicles Running and Maintenance Expenses	6,80,345	4,55,603
g)	Postage, Telephone and Communication Charges	17,50,785	17,51,567
h)	Printing and Stationary	1,35,065	3,22,766
i)	Travelling and Conveyance Expenses -Inland	1,22,76,558	73,33,712
	Travelling and Conveyance Expenses -Foreign	9,74,912	4,96,887
j)	Expenses on Seminar & Workshops	19,51,313	9,62,828
k)	Subscription Expenses	4,61,325	41,393
l)	Expenses on Fees	2,44,800	1,72,001
m)	Auditors Remuneration	1,75,000	1,75,000
n)	Professional Charges	6,90,050	13,50,900
o)	Library Expenses	11,41,070	9,78,708
p)	Training Expences	15,91,117	36,52,024
q)	Publication Expenses	3,73,425	
r)	Advertisement and Publicity	13,32,804	51,08,812
	TOTAL	**37,79,85,555**	**35,53,65,210**

Place: Bangalore.
Date 19-08-2024

CENTRAL POWER RESEARCH INSTITUTE, BANGALORE

Schedules forming part of Income & Expenditure
for the year ended 31st March 2024

(Amount in Rs.)

	SCHEDULE 15	Current Year	Previous Year
	Depreciation & provision for doubtful debts		
a)	Depreciation for the year	28,72,62,999	27,67,83,272
b)	Provision for doubtful debts	2,00,00,000	2,00,00,000
	TOTAL	30,72,62,999	29,67,83,272

Place : Bangalore,
Date : 19-06-2024

Schedule – 16

Significant Accounting Policies attached to and forming part of Accounts for the year ended 31st March 2024.

Background: - The Institute, an autonomous body under Govt. of India, Ministry of Power established through a resolution vide No.33 (14)/74-Policy: dated 21/10/1974 is totally focused on Power Research. The Institute has been recognized by Ministry of Science & Technology as an S&T Institution. The Institute has been further recognized as Scientific and Industrial Research Organization by Government of India, Ministry of Science and Technology vide their letter No. 11/68/88-TU-V, dated 05/04/2017. The Institute as a legal entity is registered with the Registrar of Societies. The basic objectives of the Institute is to serve as a National Testing & Certification Authority and act as an apex body for initiating and coordinating Research and Development in the field of electric power. The Government of India is supporting the activities through grants. Additionally, the Institute is generating revenue for regular maintenance through test fees and professional services rendered to Government organizations/Electricity Boards/Commercial organizations etc.

1. **Method of Accounting:**
   The financial statements have been prepared to comply with the Generally Accepted Accounting Principles. The financial statements have been prepared under the historical cost convention on an accrual basis. The accounting policies have been consistently applied by the Institute. The Bonus paid to employees are accounted in the year of payment.

2. **Fixed Assets:**
   Fixed assets are stated at cost. Cost comprises the purchase price and any attributable cost of bringing the asset to its working condition for its intended use. Financing costs relating to acquisition of fixed assets are also included to the extent they relate to the period till such assets are ready to be put to use.

   The Grants are contribution by Govt. of India towards total capital outlay of Projects and no repayment of the same is ordinarily expected. Fixed assets acquired under Capital Projects, R & D Plan, Sponsored Schemes and loans are stated at their original cost of acquisition. The funds provided for acquisition of these Fixed Assets under Grant-in-Aid from Government of India / other Agencies are exhibited as Capital Reserve.

   Fixed Assets acquired out of Non Plan funds were being capitalized @ Rs.1-00 per asset and the balance amount charged to Income & Expenditure account from the financial year 2002-03 to 2014-15. From the financial year 2015-16, fixed assets acquired out of Non Plan funds are capitalized at full value and depreciation provided as applicable.

   The Institute is a non-profit organization and therefore depreciation on assets capitalized was not provided in the accounts up to 2006-07. However, as per the decision of the Governing Council (G.C), the Depreciation was provided on the new Schemes from 2007-08 as per the rates provided in the Income Tax Rules, 1962 on written down value basis. Further, the G.C in its meeting held on 16th Nov 2009, instructed the Institute to provide depreciation from the financial year 2009-10 on all assets and the Government of India vide No.4/11/2009-T&R dated 30-03-2010 directed to provide depreciation every year by a charge to the Income & Expenditure Account on Straight line method basis.

Accordingly, the depreciation has been provided from 2009-10 on Straight line method as per the rates determined by the Management (based on the useful life of the assets) on all the assets and the total depreciation not provided for upto 31st March 2019 is of the order of Rs.245,21,89,649/- (for assets additions from 1981) as stated in the Annual Accounts upto 31-03-2019. The useful life was taken for Buildings at 28 years and Plant & Machinery at 20 years. A review of useful life of assets was made. As per the approved project proposals for creation of Capital Assets, the project period is taken at 30 years. Therefore for depreciation, the useful life of Buildings and Plant & Machinery is taken at 30 years and hence depreciation not provided worked out to Rs.1,78,74,32,013/-. Accordingly depreciation for the year 2019-20 is also charged at the revised rates.

There is a difference between the Capital Reserve and Fixed Asset Gross block to the tune of Rs.5.51 Crores. **1.** During the financial year 2010-11 an amount of Rs.482.34 lakhs being the proceeds of sale of assets at TRC, Koradi was received and fixed assets to the tune of Rs.482.34 lakhs was reduced in Fixed Asset schedule but not in Capital Reserve same rectified by reducing in capitalization and added to Grant Receipt during the year FY 2017-18. **2.** During the financial year 2009-10 an amount of Rs.9.81 lakhs being the proceeds of sale of assets was received and fixed assets to the tune of Rs.9.81 lakhs was reduced in Fixed Asset schedule but not in Capital Reserve same rectified by reducing in capitalization and added to Grant Receipt during the year FY 2017-18. **3.** Similarly an amount of Rs.495.00 lakhs was capitalized, but actual assets capitalized was Rs.489.95 lakhs, thus difference of Rs.5.05 lakhs was rectified by reducing in capitalization and added to General Reserve. **4.** Similarly the surplus on sale of Fixed Asset of Rs.54.13 lakhs as on 31-03-2017 has been added to the Capital reserve same was rectified by reducing in capitalization and added to Grant Receipt during the FY 2017-18.

Depreciation on Library Books & Films (Documentary) charged at 95% of Book Value.

Capital work-in-progress includes expenditure on Civil Works of projects, which have not been completed as at the end of the year.

3. **Depreciation Fund**:

As per direction from Governing Council, Depreciation fund is created as on 01-04-2019. The interest earned/accrued is added to the fund. Current year depreciation also was provided and added to fund.

4. **Investments:** Investments are shown at cost.

5. **Inventories:**
Inventories of stores and spares are shown at cost and cost includes expenses incurred for procuring the same wherever directly attributable. All consumables purchases are charged off at the time of procurement.

6. **Research and Development:**
Research expenditure on Research and Development is charged against the receipt of research grants. Capital expenditure on Research & Development is treated in the same manner as expenditure on other fixed assets.

7. **Foreign Currency Transaction:**
Transactions in Foreign Currency are recorded at a notional rate of exchange.

Realized gains and losses on Foreign Currency transactions are effected in the Income and Expenditure Account. The balances are recast at the end of the year based on the rate prevailing as On 31st March.

8. **Revenue Recognition:**

The Revenue in respect of Test Fees and Consultancy charges are accounted on completion of work /report. The policy of the Institute is to account the 'TDS Receivables 'on receipt of Form 16 from the client.

Interest income on deposits relating to CPRI with banks is recognized on time proportionate basis.

9. **Retirement Benefits:**

(i) Post – employment benefit plans:

(a) Defined Contribution Plan –

Contribution to New Pension Scheme are accrued in accordance with applicable statute and managed as per Government rules and regulations.

(b) Defined Benefit Plan

The liability towards retirement benefits like Pension, Gratuity and Leave Encashment are ascertained on the basis of Projected Unit Credit Method with actuarial valuation and provided in the books of accounts.

(ii) Short term employment benefits:

The undiscounted amount of short term employee benefits expected to be paid in exchange for services rendered by employees is recognized during the period when the employee renders services. These benefits include compensated absence and other incentives.

(iii) Pension payments:

Pension payments are accounted for April to March every year.

As per our report of even date
for **V.K.NIRANJAN & CO.,**
Chartered Accountants,
FRN :002468S

19/8/24

(C.S.MURALI KRISHNA)
Chief Accounts Officer

19/8/2024

(B.A.Sawale)
Director General

(Niranjan V.K.)
Partner
Membership No. 021432

Place: Bangalore.
Date: 19-08-2024

Schedule – 17

Notes on Accounts & Contingent Liability attached to and forming part of Accounts for the year ended 31st March 2024.

1. **Fixed Assets and Depreciation:** -Upto 2002-03, the Institute capitalized all costs relating to the acquisition and installation of all fixed assets. From the year 2002-03 onwards, the Institute has changed its policy for accounting capital assets as under

   - ➔ All assets acquired under Capital Projects, R&D Plan, Sponsored Schemes, RSOP Schemes are capitalized with all costs relating to their acquisition.

   - ➔ All assets acquired-out of Non-Plan (Revenue) expenditure of the Institute were charged off to the Income & Expenditure account from the financial year 2002-03 to 2014-15. Total value of assets charged off from 2002-03 to 2014-15 is Rs.1691.00 lakhs. In the financial year 2015-16, the Institute started to capitalize 'at cost' all assets acquired out of Non-Plan (Revenue) expenditure and depreciation provided as applicable.The Institute is maintaining a fund "Maintenance, Repairs and Obsolescence – Fund" by charging certain amount to the Income & Expenditure Account. The Institute is utilizing this fund towards revenue and certain capital expenses. As the charge is already provided to the Income & Expenditure account, depreciation is not provided on such assets acquired out of this fund. The value of such assets is NIL lakhs for 2023-24 (Rs.42.63 lakhs for the previous year) and Rs.1699.76 lakhs up to 2023-24.

2. **Government Grant: -** Grant received from the Government of India and other organizations towards specific projects are shown as capital/sponsored grants. The Institute confirms compliance of all the conditions of the grant. The Institute consistently has followed the procedure of showing the assets procured from such grants under the Fixed Assets.

3. **Reserve for Capital Expenditure out of CPRI generated funds: -**

   a) Ministry of Power, Government of India, vide letter No. 5/4/2013-T&R dated 25-02-2014 while conveying approval for the project 'Augmentation of New Facilities Projects' for Rs.105.90 Crores has directed C.P.R.I. to (i) bear 10% of the total outlay of the projects i.e., Rs.10.59 Crores and (ii) also bear additional funds, if any required over and above the approved outlay including any escalation of FE component of the project, from its internal resources. In the same way Ministry of Power, Government of India, vide letter No. 5/5/2014-T&R dated 05-01-2015 conveyed approval for the project 'Augmentation of High Power Short Circuit Test facilities and establishment New Facilities Projects' for Rs.996.10 Crores. The same was revised to Rs.979.00 crores vide Ministry of Power letter No.4/1/2020-T&R dt.14-01-2022 has directed C.P.R.I. to (i) bear 10% of the total outlay of the projects i.e., Rs.97.90 Crores and (ii) also bear additional funds, if any required over and above the approved outlay including any escalation of FE component of the project, from its internal resources.

   The total amount to be contributed by C.P.R.I. on account of above mentioned projects is Rs.108.49 Crores (10.59+97.90) to meet the above expenditures, C.P.R.I. has created a reserve by name "Reserve for Capital Expenditure out of CPRI generated funds" and the credit balance under this reserve as on 31-03-2024 is Rs.81.99 crores.

(b) National High Power Test Laboratory Pvt. Ltd. is a Joint Venture of NTPC, NHPC, Power Grid, DVC and CPRI. The total equity of NHPTL is Rs.152.00 Crores, contributed equally by JV Partners of Rs.30.40 Crores each.

CPRI had contributed the amount by obtaining Plan Grant of Rs. 24.00 Crores from MoP and the balance of Rs. 6.40 Crores was contributed from Internal Resources. M/s. N.H.P.T.L. requested to provide temporary loan of Rs.6.00 Crores from each JV Partner vide letter no.NHPTL/JVs/1643 dated 21.03.2018 towards repayment of loans to M/s. Power Finance Corporation. The same was paid on 28.03.2018 from CPRI General Reserve with the approval of Ministry of Power vide letter no.31-4/1/2018-T&R dated 27.03.2018 for a period of 3 months. Later on as NHPTL had requested for extension of the temporary loan for another 3 months as they were in the process of negotiating larger loan from Banks and Financial Institutions vide their letter No. NHPTL_F&A/019 dated 14.06.2018. The extension of period for temporary loan was obtained from MoP vide letter no. 31-4/1/2018- T&R dated 26.06.2018. The temporary loan is still not settled by M/s NHPTL since NHPTL has requested to provide additional loan of Rs. 12.40 Crores from each JV Partner. CPRI is receiving simple interest @ 10% p.a. on the temporary loan amount.

In accordance with the approval of Government of India, Ministry of Power vide letter No. 5/18/2007- T&R dated 16-01-2012, an amount of Rs.2,390.00 lakhs has been paid towards initial equity contribution in M/s National High Power Test Laboratory Pvt Ltd., New Delhi, (M/s NHPTL) a Joint Venture Company of 5 equity partners viz., NTPC, NHPC, POWERGRID , DVC & C.P.R.I. The total equity share of C.P.R.I. would be Rs.2,400.00 lakhs being 1/5th equal share of the total equity capital of Rs.12,000.00 lakhs, equally shared by all the 5 equity partners.

2,39,00,000 shares of Rs.10.00 each for total amount of Rs.2,390.00 lakhs was allotted and Share Certificates have been issued to C.P.R.I. M/s N.H.P.T.L, called for allotment of 1,00,000 shares of Rs.10.00 each during February 2017 and the same was paid to M/s N.H.P.T.L.

M/s N.H.P.T.L. has decided to increase its Equity capital. Hence it has asked C.P.R.I. to pay an amount of Rs.640.00 lakhs, towards allotment of 64,00,000 shares of Rs.10.00 each. Ministry of Power, Government of India, has asked C.P.R.I. to make this investment of Rs.640.00 lakhs out of its own Funds / Reserve and accordingly the amount of Rs.640.00 lakhs was paid to M/s N.H.P.T.L. during February 2017. The shares were allotted to us and the share certificate for Rs.650.00 lakhs has been received.

M/s. N.H.P.T.L. requested to provide temporary loan of Rs.600.00 lakhs from each JV Partner vide letter No. NHPTL/JVs/1643 dated 21.03.2018 towards repayment of loans to M/s. Power Finance Corporation. The same was paid on 28.03.2018 from CPRI General Reserve with the approval of Ministry of Power vide letter no.31-4/1/2018-T&R dated 27.03.2018 for a period of 3 months.

As per NHPTL revival plan, the Deposit of Rs.18.40 crores given by CPRI to NHPTL will be converted to equity at Rs.10/- per share of M/s NHPTL i.e. 1,84,00,000 shares as per the minutes of Meeting held on 15th September, 2022. Hence, the cut-off date for Interest payment on Deposits shall be up to 15th September, 2022 being the date agreed by Heads of Promoter Organisations during the Ministry of Power Meeting. Accrued Interest on deposits made with M/s NHPTL for the period from 16.09.2022 to 31.03.2023 has been reversed during the year to the extent of Rs.99,30,960/- and interest for the year 23-24 is not accounted to the extent of Rs.1,84,00,000/-. Equity shares have been converted after the Balance Sheet date, hence effect of the same has been disclosed here in notes to accounts.

In this context, to this effect out of 1,84,00,000 shares, 1,31,63,750 shares have been transferred to M/s Power grid as per MOP and balance 52,36,250 shares are held with CPRI during the FY 24-25.

4. **Retirement Benefits:** - The Governing Council at its meeting held on 17.10.2007, directed CPRI to provide for the liability from internal resources/charging to Income & Expenditure Account. Monthly pension and retirement benefits are to be met out of Interest received on the invested fund. In case of shortage same have to be charged to Income & Expenditure A/c.

   The liability on account of Pension, Gratuity etc., was evaluated as on 31.03.2024 through M/s LIC of India and the liability has been estimated at Rs.73,090.00 lakhs. (Estimation received from M/s Transvalue is Rs.1,06,665.00 lakhs). The opening fund balance was Rs.72,618.24 lakhs. During the year Rs.8,000.00 lakhs was allocated out of the surplus of the institute.

   Interest earned on Superannuation Fund Investment over and above utilization was added to fund since beginning. The same is re stated as Additional Interest on Superannuation Fund and disclosed separately from FY 2022-23 and stands at Rs.11,341.36 lakhs. The additional interest earned during FY 23-24 is Rs.1,468.05 lakhs Additional interest also added to corpus totalling upto Rs.93,464.80 lakhs as on 31.03.2024.

5. **Income Tax Cases :--**

   The CBDT vide Notification No.27/2016 (F.No. 203/32/2015/ITA-II) dated 07-04-2016 has notified C.P.R.I. in the category of 'Scientific Research Association' under Section 35 and sub section (i) and (ii) of Income tax Act 1961 from Assessment Year 2003-2004 onwards and consequently C.P.R.I. has become eligible for exemption from Income Tax under section 10 (21) of the Income Tax Act 1961.

   C.P.R.I. has applied for refund of TDS of Rs.25.43 lakhs for AY 2006-07 and for AY 2014-15 there is an outstanding TDS to the tune of Rs.901.07 lakhs.

Sl. No.	A.Y.	Issue and status of the of the cases as on 31.03.2021
1	2011-12 2012-13 2013-14 2014-15	Appeal was filed with ITAT, "C" Bench regarding taxability of Quarters occupation under perquisites and the appeal was party allowed vide order dated 13.10.2017. The case is pending with Income Tax Department.
2	2014-15	Appeal was filed with CIT (A)-14 and a personal hearing was attended on 31.01.2019. On follow up it is understood that the file has been moved for "National Faceless Appeal Centre". We received communication stating that, appeal has been accepted and income assessed as NIL. Order Giving effect u/s 250 of CIT(A) has been issued on 27.07.24. Refund awaited.

6. **Service Tax Cases:-**

A) As per order no. 35/Commr/ST/ADJ/BPL-I/2014 dated 31.01.14, the Commissioner, Central Excise & Service Tax, Bhopal has raised a demand of Rs. 8,09,51,984/- (Service Tax, Interest and Penalty) alleging non-payment of Service Tax on Advance Payment received during the period July 2005 to June 2011. An appeal is filed against the said order with the CESTAT, New Delhi on 24.4.2014 which is pending for adjudication. The Hon'ble Tribunal Bench of CESTAT vide its Order dated 07-10-2015 has ordered for a deposit of Rs.5,67,91,862/- . The Institute complied with the Order and deposited Rs.5,67,91,862/- being the demand of Service Tax along with Interest. An appeal has been filed on 22.11.2017 in the Hon'ble High Court of M.P Jabalpur and the case is pending.

B) The Asst. Commissioner of Service Tax Service Tax Division II, Bangalore vide Order No.28/2013, dated 24.06.2013 has raised a demand of Rs.52,952/- as Interest on belated payment of Service Tax on Advance Deposits. The Institute has filed an appeal before the commissioner of central excise against the Adj. Order on 14-09-2013.

C) A Show Cause Notice No.C.No.IV/01/51/2013 ST Divn.II/1973/13, Dt 09/05.2013 issued, demanding Rs.2,06,712/- being ineligible cenvat credit claimed on "Hiring of Vehicles" and "Catering Services" during the year 2011-12. A reply was given to this Show Cause Notice vide letter dated 30.08.2013. On receipt of reply from CPRI, a demand for Rs.1,13,410/- towards CENVAT on catering services was allowed vide Order No. 32/2015 dated 27-11-2015. The authorities disallowed CENVAT credit of Rs.93,302/- on 'rent-a-cab' for which CPRI has filed an appeal for availing CENVAT credit.

D) The audit team of Service Tax department audited the accounts for the period from October 2013 to March 2015. In the Audit Report, they demanded to pay a sum of Rs.25,46,328/- , out of which an amount of Rs.2,79,494/- was remitted. CPRI filed an appeal for remaining amount of Rs.22,66,834/- and the case is pending.

7. **Other Cases :-**

a) CPRI had received a request for refund of unutilized test charges of Rs.4,10,900/- from M/s. Jabshetty Transformers, Gulburga during the month of May 2016 through their representative, Shri B Puttaraju who was a regular visitor to the Institute on behalf of M/s. Jabshetty Transformers. For transferring the amount, CPRI had requested M/s. Jabshetty Transformers for RTGS details which they provided through an email. Based on the RTGS details given by them, CPRI transferred Rs.4,10,900/- to the account as provided ie. M/s. M&CDCC Bank Ltd., Mysore

On informing M/s. Jabshetty Transformers through email about the transfer of the above amount, they informed back that they did not ask for refund/transfer and also no money had reached to their account. On enquiry it was found that Shri B Puttaraju, the representative of the M/s.Jabshetty had fictitiously created another account in the name of M/s.Jabashetty Transformers in M&CDCC Bank Ltd., Mysore.

M/s.Jabshetty Transformers has sent legal notice for refunding the amount which was transferred to M/s. Jabashetty Transformers Account. This is being defended by our Legal Advisers, Ravi, Suri & Sunitha, Malleswaram, Bangalore. A case was also filed in this regard, in the Sadashivanagar Police Station on 20th Oct. 2016. The matter is still pending.

b) There is an arbitration case going on between CPRI and Purushottama Raju in Hon'ble High Court of Karnataka for Civil Works of EMI/EMC building construction vide case No.COMAP No.224/2022. The party has claimed Rs.4,84,08,273/- along with Interest till the case is settled. The matter is still pending. Rs.1,00,00,000/- paid as Arbitration Deposit to City Civil Court, Karnataka.

8. **Contingent Liabilities**: -

a) On account of Letter of Credit opened and remaining to be honored – NIL (excepting Letter of Credits with 100% margin) (NIL for 2023-24).

b) Estimated amount of liability on account of capital contracts - Rs.8,962.87 lakhs. (Rs.11,744.49 lakhs for 2022-23).

c) Claims not acknowledged as debts by the Institute – NIL

d) Bank Guarantees furnished to various clients by the Institute is of the value of Rs.273.34 lakhs as on 31.03.2024 backed by deposits to the full extent.

e) The total amount of Demand received from Service Tax Department (as provided in para 6 above) is Rs.836.44 Lakhs.

f) The liability towards remittance of NPS Employer contribution to Shri. N Murugesan Former DG is Rs.17,86,025/- for the period from 22nd March, 2010 to 31st July, 2024 including interest which is not provided for in the books.

9. **Sponsored Projects** :-
The Institute is engaged in core research activity funded by Government Grants. Apart from this, research activity for Government, Semi-Government and private agencies are also carried out on Sponsored basis. The cost of such research is fully funded by such agencies. The element of service if any in such activity is separately identified and charged.

10. The Institute has a system of Internal Audit conducted by a firm of Chartered Accountants.

11. The grant balances shown at Schedule–4 are exclusive of Margin Money Deposits for LC establishment towards the import of equipments. The Margin Money Deposits as on 31.03.2024 are Rs.16,387.50 lakhs (Rs.19,727.13 lakhs as on 31.03.2023).

12. Accrued Interest on Investments made in Public Sector Undertakings is calculated based on simple interest method.

13. Balances under NPS Fund for which PRAN were not generated have been moved to NPS-Security Deposit and the corresponding investment moved under Investments schedule.

14. Figures for the previous year have been regrouped wherever necessary to conform to the presentation of the current year.

As per our report of even date

For V.K.NIRANJAN & CO
Chartered Accountants,
FRN :002468S

19/8/24
(C.S.MURALI KRISHNA)
Chief Accounts Officer

19/8/2024
(B.A.Sawale)
Director General

(Niranjan V.K.)
Partner
Membership No.021432

Place: Bangalore
Date: 19-08-2024

केन्द्रीय विद्युत अनुसंधान संस्थान
(भारत सरकार की सोसाईटी, विद्युत मंत्रालय)
प्रो सर सी. वी. रामन रोड़, सदाशिवनगर डाक घर, पो. बा. सं 8066, बेंगलूर – 560 080
CENTRAL POWER RESEARCH INSTITUTE
(A Govt of India Society under Main. of Power)
Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8066, Bangalore - 560 080, India
वेबसाईट/website : http://www.cpri.in

Reply to the Independent Auditor's Report

Observation	Reply
CPRI has invested Superannuation fund with M/s LIC of India to the extent of Rs.934.25 Crores for the year ended 31.03.2024 with current year provision of Rs.80.00 crores. CPRI has received two Actuarial valuation reports as follows a. Estimation received from M/s Transvalue Consultants is Rs.1,066.65 Crores. b. Estimation received from M/s LIC of India is Rs.730.90 Crores. Hence the surplus for the year has been overstated Rs.132.40 Crores (as per M/s Transvalue Consultants valuation) and excess provision made as per M/s LIC of India.	Though the estimates are received from the Organizations, the allocation can be maximum to the extent of surplus available, before considering the allocation to SAF. As payments will be more for future retirees and pensioners, to the extent possible of Rs.80.00 crores was set aside for SAF. The surplus stood at Rs.8.63 crores for 2023-24 after making provision of Rs.80.00 crores to SAF.

Chief Accounts Officer
(C S MuraliKrishna)

Place: Bengaluru
Date: 16.10.2024

40 kA Temperature Rise Test Facility at CPRI, Bengaluru

AMI System Testing

CENTRAL POWER RESEARCH INSTITUTE

Prof. Sir. C. V. Raman Road, Sadashivanagar P.O.,
P. B. No. 8066, Bengaluru – 560 080, Karnataka, India.
Tel: +91 80 22072201/22072207/22072215
Fax: +91 80 23601213
Website: www.cpri.res.in

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