**CERTIFICATE COURSE IN ELECTRIC POWER MANAGEMENT**

**Duration: 12 Weeks**

**AIM:**

Power is a critical infrastructure for development of any nation. The socio-economic development and life-style of citizens depends on availability of power. The availability and quality of power supply depends on proper planning, designing, use of latest technologies and practices for effective and efficient management of the system. It has become, utmost important to review the existing practices & technologies adopted to optimize and modernize them, so as to supply electricity at affordable cost to all categories of consumers to help bolster economic growth. The entire gamut of power management, i.e., generation, transmission, distribution, financial aspects, accounting practices and general management aspects will be dealt in the course.

**OBJECTIVE:**

* Impart knowledge on planning, designing and operation & maintenance of power sector systems
* Orient the participants with the latest equipment and technologies of the power sector
* Discuss about energy accounting, auditing and management aspects for efficient management of power business.

**CONTENTS OF THE COURSE**

**Introduction to Power Sector (2 Week)**

Overview of Power scenario & Indian experience

Organizational Structure of Power Sector in India

 Restructuring & Power Sector Reforms, Electricity Act, 2003

Role of Regulatory Commissions in India & International experiences

National Electricity Policy, Rural Electrification Policy and Tariff policy

Open Access and trading in power

**Power Generation Management (2 Weeks)**

Planning and Designing of power generation projects

Types of generation projects (Thermal, Gas Atomic and Hydro power ­Plants)

Economics of Power generation under various options

O & M of power generation projects

Renovation and Modernization of Generation Projects

New and Renewable energy sources – Solar, Wind, Biomass/Municipal Waste, etc.

Automation for efficient management of power plants

CERC Norms for power generation and project completion

Energy conservation in Power plants

Control systems and protection including Generator protection

Fixation of generation Tariff under cost plus method and competitive bidding

**Transmission Management (2 Weeks)**

Transmission System Planning

Tower Design, Erection and Structural Details

Transmission line materials, Tower erection, Line stringing and commissioning

Technical and Economic aspects of Systems Interconnection

Electric Power Transmission by HVDC System

Inter-System Power Exchange & ABT

Maintenance of EHV- AC and HVDC Substation and Electrical Equipment

Best practices in Grid management

Gas Insulated Sub-stations (GIS)

Bus-bar arrangements and design

Power System Protection

Power Transformers – Erection, Testing, Commissioning and O & M

SCADA Applications & Functions

Design of substation structures, erection and testing and commissioning of a substation

Transmission and SLDC tariff fixation

Reactive power management

Communication systems and OPGW

**Distribution Management (2 Weeks)**

Load forecasting, planning and designing of distribution system

Integrated Distribution Planning for Loss Reduction and Voltage Improvement

Standards, Specifications of materials and Construction practices

O & M of Overhead lines and Sub-stations

Distribution Transformers – Installation and O & M

Switchgear – Installation and Maintenance

Adoption of Innovative and Cost Effective Technologies & Unmanned Sub-station

Switched Capacitors & Reactive Power Compensation

Earthing System and Protection against Lightning, Surges and Transient Over voltages

Energy Meters and its technologies

DSM Tools & Techniques and its Methodology

HVDS – Control, Operation, Protection and Economics – Case Study

Energy Audit & Accounting

Safety practices, Accident Prevention and Disaster management

**Information Technology (1 week)**

IT for Transmission and Distribution Management

Management Information Systems (MIS) & Consumer Information System (CIS)

Geographical Information Systems and Global Positioning Systems (GIS & GPS)

Customer Relation Management (CRM) & Consumer Analysis Tools (CAT)

Distribution Automation and SCADA

Smart Meters & Smart Grid

**General and Financial Management (1 week)**

Detailed Project Report preparation for Power Projects

Financial appraisal of Power Projects

Monitoring and Evaluation of Power Projects

Performance Evaluation by Ratio Analysis

Tariff Structure, Billing and Accounting

Cost of Capital and Capital Budgeting Decisions

Budgeting and Budgeting Techniques

Accounting Principles and Policies

Principles and Practices of Cost Accounting

Project Management & Accounting

Leadership & Communication skills

Positive Attitude and Thinking

Exploring Self and Personality Development

Motivation and team building

Stress Management

**Project Work (1 week)**

Each participant has to submit a detailed project report on one of the aspects of the training or its applications, alternatively a lingering problem of their country can be discussed suggesting solutions from the topics learnt in the training, and the project report shall be exhaustive with diagrams and illustrations. Where required, the participant can visit certain offices or sites for collecting data or photographs and these expenses can be claimed subject to the maximum limit fixed for the Project allowance. The prepared project will be presented before the panel of Faculties who will assess the reports and suggest for additions or deletions, if any for refinement of the Report.

**Field Visits (2 Weeks)**

Visit to Generating Plants, Transmission Sub-Station, Automation and SCADA Center, Load Dispatch Centre, Manufacturing Units like, Transformer, Switchgear, Capacitors, Meters, etc.