

**Mode of Programme: ITEC (Classroom)**

**PLANNING AND MANAGEMENT OF POWER TRANSMISSION SYSTEM**

**Duration: 3 Weeks Classroom Programme**

**Dates: 04<sup>th</sup> Sept to 22<sup>nd</sup> Sept, 2023**

**AIM:**

Power is a vital infrastructure for economic development of a country. Accelerating economic growth and achieving higher standards of living depend upon the availability of adequate and reliable power at an affordable price. To make power sector commercially sound and reliable, power transmission sector plays important role. As the power demand is increasing day by day, Power Transmission has become vital link to supply power economically and reliably.

Due to increased demand from distribution sector, transmission voltages need to be increased from EHV to UHV and HVDC for efficient operation of transmission networks. Power Transmission sector being a very specialised sector needs highly trained manpower to operate and maintain EHV assets. India being a leading country in operation and maintenance of most complex power network in the globe, is an ideal case for the developing countries. India has developed a world class transmission infrastructure to handle flow of 400 GW of power to the 29 states with the diversified climatic conditions. Indian Power transmission sector has variety of latest technologies such as EHV, UHV, HVDC and GIS from 66 KV to 1200 KV which are in operation from long time.

In a path of development of Indian power sector, Government of India (GoI) has **introduced many flagship schemes such as Electricity Act 2003** and introduction of Regulatory framework at central and state government level with special and dedicated responsibility such as grid management and implementation of regulatory policies. We are sure that these Indian Practices in Power transmission sector will certainly be useful to the participating countries. This course is targeting all major areas such as design, construction, operation, maintenance, automation, protection and operational aspects of transmission systems.

**OBJECTIVE/OUTCOME:**

- Impart knowledge on design, operation & maintenance of power Transmission systems.
- Orient the participants with the latest technologies and methods including automation and IT practices in Power Transmission sector
- Discuss about the commercial and managerial aspects of power transmission business

**TOPICS TO BE COVERED:**

**Introduction**

Power scenario – Indian experience

Planning and designing of transmission system & Transmission in India, Issues & Challenges, Role of Regulatory Commissions & Electricity Act and its Amendments

### **Transmission System planning and design**

Transmission System Planning and System Design & Tower Design, Erection and Structural Details & Technical and Economic aspects of Systems Interconnection

EHV, UHV and HVDC System & Erection Commissioning and testing of sub stations and Lines

Standards, Specifications of materials and Construction practices for Transmission infrastructure

### **Operation and maintenance aspects of transmission systems**

O & M Practices of Overhead lines and Sub-stations, Power Transformers – O & M & Failure Analysis, EHV Switchgear –Maintenance Practices & Protection Aspects of Transformers,

Sub Station Equipment and Lines & AC and DC systems including battery capacity required

Communication system for data transmission and protection covering PLCC and OPGW

Inter-System Power Exchange & ABT, Maintenance of EHV-AC and HVDC Substation and

Electrical Equipment & Hotline maintenance practices and Emergency restoration systems

### **Best Practices in Grid Management**

Regulatory issues, IT Application in Transmission system, Safety Measures and Prevention of Electrical Accidents, Reliability issues, handling of blackouts and best practices to avoid

blackouts and grid failures

### **Advance topics in O&M of EHV Substations and lines**

Condition Monitoring of Power Transformers and Substations &

Hotline Maintenance Practices & Gas Insulated Substations and Automation Concepts

Substation Automation & SCADA and SAS

### **Commercial Aspects**

Tariff Structure, Billing and Accounting & Annual Revenue Requirement Calculations for Transmission Tariff Fixation & Open Accession in Transmission and Congestion

Management

### **Information Technology (IT)**

IT for Transmission Management & Management Information Systems (MIS)

SCADA Applications and Functions

### **Local Field Visits**

SCADA and Power Management Center & Field Visit to a 400/220 KV SS and a Gas

Insulation Substation & Transformer Manufacturing & Load Dispatch Centre

### **Projects and case studies**

Understanding social, Economic and technical impact of transmission projects located nearby Hyderabad through detailed projects and case studies