

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

**DESIGN, CONSTRUCTION AND OPERATION OF DISTRIBUTION SYSTEMS**

**Duration: 3 Weeks Classroom Programme**

**Dates: 07<sup>th</sup> Aug to 25<sup>th</sup> Aug, 2023**

**AIM:**

Power Distribution system is a segment of power system working very closely to the consumers. Being a consumer service organisation has more consumer expectations such as supply of quality, reliability and at the most reasonable rates. Further electricity business can never be a business only commercial perspective but also has social inclination. Because of its social perspective, more dominant in developing countries, responsibilities of Distribution Service Providers further increase to make it available to the farthest corner of the country for that section of society which are away from main stream. Over last few decades, India has grown from very humble background to a third largest country in the world in term of generation and consumption of Electricity.

In last few decades, India through its many flag ship schemes of Government of India dedicated for power sector such as **Integrated Power Development Scheme (IPDS), Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) for 100% Village Electrification, SAUBHAGYA- Pradhan Mantri Sahaj Bijli Har Ghar Yojana** with objective to provide Electricity for every home has made it possible to develop Electrical Infrastructure all over the country and make provision of Electricity available for every Indian.

Experience of Indian Power Sector is very relevant to the countries on the growth trajectory is very relevant. Considering all this, a programme address to share Indian Experience of a managing third largest power sector in reliable and economical way. This programme is designed to addresses technical, financial and managerial aspects of engineers and managers working in power distribution sector by making them aware about challenges and opportunities in Power Distribution Sector. Programme develops complete know how related to design, planning, operation and management of power distribution systems.

**OBJECTIVE/OUTCOME:**

- Orientation towards the state-of-the-art technologies and best practices in the O&M of distribution substations and lines
- To discuss latest trends, modern maintenance practices and automation concepts.
- To familiarize participants with the advance automation and protection practices adopted in the sector
- To facilitate group discussions, interaction and experience sharing among the participants.

**TOPICS TO BE COVERED:**

**Planning of Distribution Substations and lines:**

Short & Long-Term Planning of Distribution System Analysis – Load for casting

Location of 33/11 KV Substation – Planning models

**Design and construction of Distribution substations:**

Construction of 33/11 KV Substation \_ Selection of site, Substation and Grading and Drainage- Fencing, Road & Gate.

Design of 33/11 KV Substation – Orientation, Single line diagram, site layout, structural layout – Both for indoor and outdoor substation

33/11 KV Substation materials, structures, bus bars & Instructions and their design

33/11 KV Substation Equipment - Brief Technical specification of Power Transformer, Vacuum Circuit Breakers, SF6 circuit breakers, Lightning Arrestor, Instrument Transformers (CTS & PTS), Control & Relay Panel, Battery & Battery Charges, Communication Equipment, Power & Control Cables & Design of Earthing for 33/11 KV Substation Specifications of material used for materials & Insulation Coordination and Lightning protection for 33/11 KV Substation

**Design, Specification and construction of Distribution Systems/Lines**

Specification of materials used in Distribution Lines, DTRS and Construction Standards  
Type of DTRS & Mechanical Design of Lines, Span and Sag Calculations – Use of Sag Tension Charts for various type of condition & Electrical Design of Lines, 33/11 KV Substation voltage regulation, calculations, choice of conductors, choice of voltage  
Construction of lines & Earthing of lines

**O&M of Distribution Substation and lines**

Maintenance Schedules and practices for various equipment in Substation best O&M Practices.

O&M of Distribution Lines and DTRS – Best practices

**Protection of Distribution substations and lines:**

Protective and Relying and Relay Coordination & Exposure to the Condition Monitoring to improve availability of system and extending the useful life of 33/11 KV Equipment.

**Safety practices in O&M of Electrical equipment**

**Advance concepts in Distribution system Management**

Condition Monitoring, Reactive Power Compensation in Distribution System

**Field Visits:** Distribution Sub-Stations –33/11KV, Load Dispatch & SCADA Centers

**Project and case studies:**

Based on the topic a case studies and projects will be offered to participants to give more practical exposure.