

**Course Overview:**

This course is intended to prepare the target persons with the ability to recognize, understand, and perform preliminary electrical load calculation/estimation in power distribution system. Trainees will know how to deal with deriving load measurements and studying the impact of tap-changers on both load and system characteristics.

**Course Objective:**

- Review of electric power distribution load characteristic (how it is done)
- Understand practical characteristic and planning methods
- Understand basic theory and mathematics of modern distribution load characteristic.
- Estimate Power Quality State.
- Specify the accuracy and information content requirements.

**Course Outline:****ELECTRICAL LOADS**

- Consumers Purchase Electricity for End Use Application
- Power Systems Exist to Satisfy Customers, Not Loads

**CUSTOMER ELECTRIC LOAD BEHAVIOR**

- Connected Load
- Electric Load Curves
- Demand
- Demand Factor
- Load Factor
- Power Factor
- Voltage Sensitivity of Loads
- Characterizing Customers by Class
- Customer Class Peaks Occur at Different Times

**CONVERSION OF ELECTRICITY TO END USE**

- Appliances Convert Electricity to End Uses
- Appliance Output Is Controlled by Varying Duty Cycle
- Appliance Duty Cycles and Coincidence of Load
- Coincident Load Behavior in General
- Coincident Curve: Expectation of Non-Coincident Load
- Importance of Coincidence Assessment in T&D Design
- Coincidence Factors and Curves
- Coincidence of Load Varies as Demand Varies
- Load Duration Curves
- Coincidence Curve and DSM Interaction

**MEASURING LOAD CURVE DATA**

- Load Sampling Rate and Type
- Observed Load Behavior and Sampling Rate
- Signal Engineering Perspective on Load Sampling
- Determination of the Sampling Method and Type
- Addition and Averaging Filter Load Curve Data

**Training Language:**

EN / AR

**Training Methodology:**

- Presentation & Slides
- Audio Visual Aids
- Interactive Discussion
- Participatory Exercise
- Action Learning
- Class Activities
- Case Studies
- Workshops
- Simulation

- Sampling Rate Influences Load Duration Curve Shape

DISTRIBUTION LOSSES ARE NOT PROPORTIONAL TO DEMAND SQUARED

- Relationship Between Losses and Demand
- Mean Error in Estimating Loads
- Modeling Losses on the Distribution System

- Losses vs. Demand on the Entire Distribution System

T&D SYSTEMS ARE BUILT TO SATISFY CUSTOMERS, NOT LOADS

- Quantity, Quality, and Value

GROWTH OF ELECTRIC LOAD AND T&D CAPACITY REQUIREMENTS

- Spatial Distribution of Load Defines T&D Needs
- Load Density Varies With Location
- Growth Drives System Expansion
- Two Causes of Load Growth
- Spatial Load Growth and the S<sup>TM</sup> Curve Characteristic
- Relation of Load Growth Causes to S<sup>TM</sup> Curve Shape
- Growth Behavior as a Function of Spatial Resolution Regions Fill Up<sup>TM</sup> In A Discontinuous Manner Putting Out Fires<sup>TM</sup> Is the Norm in T&D Expansion

LOAD FORECASTING

- Power system component, load types, load estimation and load forecasting
- System analysis
- Load Sampling Rate, Load Forecasting
- Load Forecasting Techniques & Procedures

### Who Should Attend:

This training course is benefit all levels of electrical engineers in scope of design, installation, operation and maintenance. It will enable them to master and understand the power system components, loads, protection and maintenance. The training course will greatly benefit:

- Planners and Analysts Engineers
- Electrical Engineers
- Electrical Supervisor
- Load Dispatch Center Engineers and Supervisors
- Electrical Distribution Engineers
- Operation & Maintenance Engineers