

# € TRAINING

Electric Power Distribution System For  
Industrial Plants





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## Introduction:

This training program will cover all aspects of power distribution, including system planning, equipment selection, and application, system grounding, protection and conformity with electrical code requirements. Participants will work under instructor guidance to develop a power distribution system single line diagram for a typical industrial plant.

## Program Objectives:

At the end of this program, the participants will be able to:

- Plan their system and select equipment for it.
- Benefit from a clear understanding of all aspects of the power distribution system.
- Apply the Electrical Code to their projects.
- Deal with the important issues such as load estimating, voltage selection, shortage circuit studies, and power protection.
- Make their distribution system more efficient by applying your new knowledge of the power distribution system and equipment.

## Targeted Audience:

- Electrical power distribution and System engineers.
- Plant engineers from all types of industries particularly chemical and petroleum
- Large institutional power distribution engineers.
- Consulting engineers.
- Other engineers as well as technical personnel involved in the design.
- Engineering.
- The operation, and maintenance of power distribution system in industrial plants.

## Program Outlines:

Unit 1:

## System Planning As Applicable To Industrial Plants:

- Understanding the importance of load estimates for proper system sizing.
- Addressing voltage considerations and flicker to maintain system stability.
- Exploring different distribution types suitable for industrial plants.
- Understanding substation bus arrangements for efficient power distribution.
- Reviewing conceptual single line diagrams to visualize system layouts.

## Unit 2:

### Short Circuit Studies For Equipment Rating And Relaying:

- Familiarizing with applicable standards for short circuit studies.
- Learning methods of calculations for determining short circuit currents.
- Gathering system and equipment data crucial for accurate analysis.
- Demonstrating short circuit calculations through practical examples using hand calculations.
- Understanding the importance of short circuit studies in equipment rating and relay coordination.

## Unit 3:

### Load Flow Calculations:

- Understanding the significance of load flow studies in system operation and planning.
- Addressing voltage drop concerns to ensure voltage stability.
- Exploring voltage instability issues and methods to mitigate them.
- Analyzing the effects of current limiting reactors on load flow.
- Optimizing load flow for efficient system performance.

## Unit 4:

### System Neutral Grounding:

- Exploring different grounding methods including ungrounded, high resistance, low resistance, and solidly grounded systems.
- Understanding the role of cable insulation and its relationship with system grounding.

- Examining neutral grounding practices for generators to ensure system reliability.

## Unit 5:

### Review Of Major Equipment:

- Assessing key components such as motor control centers, switchgear, and power transformers for industrial applications.
- Understanding the application of power cables and electric motors in industrial settings.
- Exploring the role of surge arresters in protecting equipment from voltage surges.
- Addressing the impact of harmonics from non-linear loads on power systems.
- Studying capacitor applications and the function of instrument transformers in industrial environments.