

COURSES MODULE

For

ELECTRICAL DESIGN

ENGINEERING



Course Outline

- ❖ Coordination with Other Disciplines
- ❖ Electrical Drawings, Documentation and Schematics
- ❖ Estimation of Plant Electrical Load
- ❖ Power Distribution
- ❖ Switchgear for Power Distribution
- ❖ Development of Single Line Diagrams (SLD)
- ❖ Control Schematics
- ❖ Selection and Sizing of Electrical Equipments
- ❖ Hazardous Area Classification and Selection of Equipments
- ❖ Cable Selection and Sizing
- ❖ Cable Routing
- ❖ Power System Protection and Co-ordination
- ❖ Electrical Safety and Grounding/Earthing, Bonding and Lightning Protection
- ❖ Power Quality, Uninterruptible Power Supplies, Surge Protection and Noise Control
- ❖ Illumination Design
- ❖ Sub-Station/ Switch Yard Layout and Design
- ❖ Procurement details of Electrical Equipment and Specification
- ❖ Electrical Applications to Oil & Gas / Chemicals/ Energy & Power industries.

Electrical Design & Detail Engineering

Basics of Electrical Engineering & Coordination with Other Disciplines

Different types of Electrical system and their Importance
Power Generation, Transmission, Distribution and Utilization
Introduction of key electrical equipments used in projects
Introduction to EIOD Electrical Basis of Designing

Estimation of Plant Electrical Load

Preparation of Load Schedule
Determination of power Supply Capacity
Standby Capacity consideration
Rating of generators in Relation to their Prime Movers
Rating Of Motors In Relation To Their Driven Machines

Development of Single Line Diagrams (SLD)

Types of SLD and their study with Legend sheet
Detail SLD, Lighting system SLD, Small power SLD, Key SLD
Metering and Control diagram

Control Schematics

Block Diagram
Schematics for Motor Feeder, Power Feeder & Transformer Feeder

Selection and Sizing of Electrical Equipments

Emergency Generator
Transformer and CT/PT
Neutral Grounding Resistor (NGR)
HV/MV Switchgears
LV Switchgears
HV/MV/LV Capacitor Bank
DC Battery & Battery Charger
AC UPS
AC/DC Machines

Hazardous Area Classification and Selection of Equipments

Zone /Division Classification & relevant codes & Standards
Types of Protection for Hazardous Areas
Hazardous source List Preparation & certification of Equipments
Marking Of Equipment Nameplates
Hazardous Area Drawings / Layouts Preparation

Cable Selection and Sizing and Routing

Power and Control cable Introduction & cable selection
Cable sizing for Low voltage system & High voltage system
Voltage Drop Consideration
Let through Energy consideration
Earth fault Loop Impedance consideration
Cable Schedule & Cable interconnection Schedule
Selection and Sizing of Cable Tray
Cable tray schedule & Drum schedule
Conduit Sizing & Selection
Cable routing Layout

Earthing & Lightning Protection Design

Requirement of Earthing in Industrial Plants
Earthing Design Calculations & Layout Design
Type of Earthing and Earthing Installation Details
Earthing Lightning Protection Requirement & Calculation
Lightening Installation Details and Layout Design

Illumination Design

Type of Lighting Fixtures & its selection
Preparation of Fixture Schedule
Indoor Illumination Calculation
Outdoor Illumination Calculation

Sub-Station/ Switch Yard Layout and Design

Introduction
Type of Sub-Stations and Layouts
General arrangement of substation
Equipment Layout

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