



I. ELECTRICAL DESIGN Engineering System:-

- Concept of EPC Projects in electrical design
- Fundamentals of Power Generation, Transmission, distribution and utilization in electrical design.
- Introduction of key electrical equipments used in projects for electrical design.
- Overview of Codes & Standards IEC / ANSI / IEEE
- Introduction of P&ID in electrical design.

II. ELECTRICAL : Estimation & Specification

- **ESTIMATION OF PLANT ELECTRICAL LOAD in electrical design**

Load Schedule, Power Supply Capacity, Standby Capacity consideration, Generators in Relation To Their Prime Movers-Importance of Max and Min temp., Motors In Relation To Their Driven Machines.

- **Electrical Equipments Selection Sizing and Protections Data-Sheet, Vendor Data Review in electrical design**

Generators, Transformers ,Motor ,Equipment, Protections,Power Capacitor Banks ,HV/MV/LV Switch gears , HV/MV/LV Capacitor Bank , Power Reactor ,C T/PT , Bus Duct ,AC UPS ,DC UPS.

- **HAZARDOUS AREA CLASSIFICATION AND SELECTION OF EQUIPMENTS in electrical design**

Types Of Protection For Hazardous Area ,Zone /Division Classification , ,Hazardous source List Preparation ,Certification of Hazardous Area Equipment ,Marking of Equipment Nameplates ,Hazardous Area Drawings/Layouts Preparation

- **Cable Selection and Sizing and cable laying methods in electrical design**

Data Sheet Preparation, IS 7098 & IEC 60502 ,Cable Sizing for high & low voltage, Cable Schedule & Drum Schedule ,Cable Interconnection Schedule.

- **CABLE ROUTING LAYOUT in electrical design**

Cable routing Layout ,Cable Tagging ,Installation details

- **Selection and sizing of electrical equipments used in various projects in electrical design**



Transformers, Motors, Switchgears, Cables, DG, Battery etc., sizing

III . ELECTRICAL Designing

- **EARTHING & LIGHTENING PROTECTION DESIGN) for electrical design**

Requirement of Earthing in Industrial Plants ,Earthing design calculations ,Type of Earthing and Details ,Earthing Installation Details ,Earthing Layout Design ,Lightening Protection Requirement ,Lightening Installation Details ,Lightening Layout design

- **ILLUMINATION DESIGN for electrical design**

Introduction ,Types Of Lighting fixtures ,Selection of lighting fixtures ,Preparation of fixture schedule ,Indoor illumination Calculation ,outdoor illumination Calculation ,calculation on software ,Lighting Layout Design ,lighting Installation Detail ,Small Power Selection ,Lighting Board Schedule

- **SUB STATION DESIGN for electrical design**

Introduction ,Types Of Substations ,General Arrangement Of Substations ,Equipment Layout

1. Post Designing of ELECTRICAL DESIGN Engineering

Intra-discipline co-ordination with civil, process, mechanical, piping, telecomHVAC etc... with electrical design

IDC, PDS,P&IDs,UFDs & ICDs , Trench routing, Piping routing, Flood/Rain water, Drainage system , Earth Quake, Black out, Fire & Alarm ,HSE, HAZOP

. Procurement Requirements and installation standards for electrical design

Preparation of BOQ, Price Break up, online bidding, Terms & Conditions ,Commercial Terms, LC, ABG, PBG, Proforma, LD etc., , Delivery terms FOR, FOB, Ex-works, FFR,RMR etc., CST, Excise Duties, ST, VAT & Insurance

Inspection of Equipments/system for electrical design

MQP, QAP & ITP, TPI, Witness, Hold Points , Type Test, Routine Test, Acceptance Tests, Performance Tests, IS & IEC clauses ,Inspection Request Form ,Stage inspection / Final Inspection ,Internal Tests, Laboratory TC, Material TC,FIR, IRN & DCC



1.Live Practicals for ELECTRICAL DESIGN

DEVELOPMENT OF SINGLE LINE DIAGRAMS(SLD) in electrical design

Key SLD ,Detailed SLD ,Lighting system SLD ,Small power SLD ,Metering and Control diagram

CONTROL SCHEMATICS for electrical design

Introduction ,Block Diagram ,Typical Schematics for Motor Feeder ,Typical Schematics for Power Feeder ,Typical Schematics for Transformer Feeder

ELECTRICAL DESIGN engineering Software's

ETAP Software

Overview of ETAP Software,

Project Settings,

One-Line Diagram,

Load Flow Analysis, Configuration & Case Study ,

Circuit Analysis (Fault Calculations and Stability Studies)

Motor Starting Study

VII. Live Projects for ELECTRICAL DESIGN Engineering (2 Nos)

EPC projects