Electrical Power Distribution Systems for Industrial Plants

Course general description:

Electric power distribution system plays an important role in the efficient operation of a modern industrial plant.Such a system includes high voltage circuit breakers, switchgear, transformers, motor control centers, electric motors, variable speed drives…,etc. A trouble-free electrical system is essential fo an interruption-free plant operation.

This course will cover all aspects of power distribution, including system planning, equipment selection and application, system grounding, protection and conformity with electrical code requirements, etc.

Participants will work under instructor guidance to develop a power distribution system single line diagram for a typical industrial plant.

Audience:

This course is designed for:

1- Electrical supervisors
2- Electrical Engineers
3- Anyone involved in the power distribution systems in industrial plants

Course objectives:

After Participating In The course, You Will Be Able To:

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

Course duration:

5 days

Course location:

Dubai

Course contents:

Day-1

System Planning As Applicable To Industrial Plants

- Load estimates
- Voltage considerations and flicker
- Distribution types
- Substation bus arrangements
- Review of a conceptual single line diagram

Day-2

Short Circuit Studies For Equipment Rating And Relaying

- Applicable standards
- Method of calculations
- System and equipment data

An example using hand calculations

Load Flow Calculations

- Importance of load flow

- Voltage drop considerations
- Voltage instability
- Loss of a source
- Effect of current limiting reactors
- Optimization of load flow

Day-3

System Neutral Grounding

System Neutral Grounding

- Ungrounded
- High resistance
- Low resistance
- Solidly grounded systems
- Cable insulation and system grounding
- Generator neutral grounding

Day-4

Review Of Major Equipment

- Motor control centers, switchgear, power transformers
- Application of power cables
- Application of electric motors
- Surge arresters
- Harmonics in power systems and impact of non-linear loads
- Capacitor applications
- Instrument transformers

Day-5

Protective Devices And Relay Setting

- Protection and co-ordination principles
- Feeder and bus protection
- Protection of medium voltage motors
- Transformer protection
- Generator protection
- Relay settings and co-ordination curves

VFD Applications

- Methods of Proper Drive Selection
- Multi-Motor Drive Systems With Example Problem
- Using VFDs to Eliminate Geared Speed Reducers
- Effects of AC Drives on Geared Speed Reducers
- Replacing Mechanical Speed Changers With VFDs

Methodology:

- 50% lectures & concepts
- 10% Videos
- 10% Case studies
- 10% Exercises
- 10% Discussions
- 10% Software (if applicable or examples)

Course code: (TEEI009)