

Bulk Electrical System and Distributed Generation

OEM: Rockwell Automation • Duration: 3 Days (24 hrs) • Code: SPE302-LD

COURSE MODULES & TOPICS

Objectives

- Define an electrical subsystem as bulk electrical or distribution
- Apply the PRC standards based on the bulk electrical system criteria
- Implement the models to create the proper protection system using EasyPower
- Perform protection coordination for specific substation
- Create TCC -Time Current Curve for the Substation
- Substation Engineering
- Protection Engineer
- Substation Operator
- Switching Authority
- Contract Manager working on a Substation Project
- Electrical Inspector
- District and Zone Managers

Who Should Attend

- Electrical Power Engineer
- Licensed Electricians
- Managers that must understand the Power Systems of the Substations
- Electrical Safety Inspectors
- Any other individuals who are interested in this subject
- Electrical Operators
- District and Zone Managers

Course Agenda

Day 1

- Introduction to Bulk Electrical System
- Criteria to define the boundary of the Bulk Electrical System
- Power zones: generation; transmission and distribution
- Protection PRC standards requirements
- Bulk Electrical System -philosophy of design

- Green energy generation systems
- Nuclear power and grid stability, active droop control
- Voltage regulation; reactive droop control

Day 2

- Capacitor switching system; condenser and reactive power regulator
- Example of power flow study for multiple utility system
- Distributed generation systems
- Requirement to connect to the distributed generation system to the grid
- Protection schemes to be used for distributed generation three phase and single-phase units
- Power quality requirements of distributed generation units
- Harmonics monitoring systems, standard requirements for maximum level of harmonics in the system voltage and current ieee519
- Harmonics elimination and compensation in a power system
- Sources of harmonics – total harmonics distortion, in a power system

Day 3

- Case study of harmonics generation when using large power convertors
- K-factor and harmonics cancelation transformers
- Zig zag transformers for elimination of harmonics
- Tuned active and passive filters -resonance and possible side effects
- Effect of harmonics on the digital protections
- Case Study of Distributed Generation System