Modern Power System Protective Relaying Training

Description

Course Description

Protection of low, medium and high voltage power systems requires an understanding of system faults and their detection, as well as their safe disconnection from the power system. This course presents a comprehensive and systematic description of the concepts and principles of operation and application of protection schemes for various power system elements such as feeders, transformers, motors, buses, generators, etc. The course begins wit an overview of power system faults and the protection scheme requirements for the detection and coordinated clearance of these faults.

Course Objective

Protection requirements for cogeneration and non-utility generation, and interconnection with the utility power system are covered in detail. This course deals with protection systems from a practical perspective, and includes important functional aspects such as testing and coordination of protection systems. It is specially designed for industries and utilities, which depend on proper system protection for operational efficiency and minimizing damage to equipment.

Course Outline

Upon the successful completion of the course, participants will be able to:

- Identify the different types of power system faults, causes & effects of power system faults, detection of faults and requirements of protective relaying system
- Enumerate the components of protection schemes including the application of Programmable Logic Controllers, circuit breakers, current and voltage transformers
- Describe the various types of current transformers & voltage transformers, application requirements of C.T.’s for protective relaying and accuracy classifications
- Give significance to power system neutral grounding found in industrial plants and high-voltage substations, calculate ground-fault current and explain the reasons for limiting generator ground-fault current to a low value
- Become aware of ground potential rise during power system faults which includes the hazards to

individuals working in electrical substations, effectsof ground-potential-rise (GPR), effects on telecommunications equipment etc.

- Learn the proper feeder overcurrent protection, protective relaying requirements for radial systems, relay setting criteria, load limitations and testing of overcurrent protection schemes
- Know the proper coordination of electrical protection systems, bus protection, motor protection, starting and control
- Explain the application of differential protection to transformers, winding temperature and oil temperature devices & analysis of transformer oil for dissolved gases in relation to transformer protection
- Understand generator protection including the differential protection, voltage controlled & voltage restrained overcurrent protection and testing of generator protection schemes
- Employ the appropriate methods of cogeneration & non-utility generation protection as well astransmission lines protection
- Learn the application of static capacitors on power systems, description of protection schemes used and the testing of capacitor protection schemes in relation to capacitor protection