Advanced High Voltage Electrical Protection

Course Description:

- This course is designed to increase the trouble shooting skills and fault diagnostic processes of engineers and maintenance teams on HV Generation and Distribution systems. The practical elements of the course center on advancing the candidate's knowledge of protection systems. The course will progressively move toward advancing the candidate's knowledge of the faults and their rectification on a ranging of electrical systems.

The Training Course will highlight:

- All Attendees should have a sound power generation and electrical background. At the end of this course, you will be able to troubleshoot high voltage systems.

Training methods:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include:

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Course outline

Day 1

Introduction

- Revision of Fundamentals of Electricity
- Description of course aims, assessment of existing knowledge, fundamentals of protection.
- Instrument/Protection Transformers
- Current and voltage transformers - theory tutorial and practical exercise involving magnetization curve.

Day 2

- Feeder Protection
- Principles and application of IDMTL O/C, DO/C, and unit protection to distribution feeder circuits and ring main systems
- Fault Energy
- Basic theory covering sources, MVA impedances simple calculations

Course outline

Day 3

- **Time Graded Overcurrent Protection**

  Current/time settings, calculations

- **Injection Testing**

  Principles, application and practical exercise involving secondary injection

- **Testing of Relays**
- **Practical exercises involving testing of various types of relays, Available eg :-**
  - Bus Zone Protection
  - Earth Fault Relays
  - Bus zone Supervision
  - Overcurrent

Day 4

- **Electrical Pressure Testing**
- **To cover the theoretical and practical aspects of electrically testing the insulation of power cables, switchgear, transformers motors etc.**
  - Safety Requirement
  - Insulation Resistance
  - Polarization Index
  - Flash Testing
  - AC Pressure Tests
  - DC Pressure Tests
  - Practical Testing Exercises

Course outline

Day 5

Transformer Protection

- Theory and application of overcurrent balanced restricted and standby fault protection, Bucholz relays.