

Power Cables Operation, Maintenance & Fault Detection

Course Description

Faults in underground cables may cause loss of supply to customers and loss of revenue for suppliers therefore it is imperative that the fault location process is efficient and accurate to minimize excavation time. For fault locating to be efficient and accurate technical staff need to have expert knowledge accompanied with experience in order to attain service reliability. This workshop is designed to ensure those responsible for the selection, laying, operation, maintenance and monitoring of power cables understands the technical issues involved and comply with relevant specification and requirements.

Course Objective

The objective of this course is provide the Participants with the skills and knowledge necessary for selecting & operating power cables and to perform testing and preventative maintenance to ensure safe operation and longer equipment life.

Who Should Attend?

Anyone associated with power cable operation, maintenance, location and fault detection techniques. Typical personnel who would benefit are:

- Operations Personnel
- Electrical Maintenance Technicians and Supervisors
- Process Control Engineers
- Service Technicians

Maintenance Personnel

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Course content

Introduction

- Historical perspective
- Development of cables for LV and HV systems
- Role of cables in modern power distribution systems
- Cable accessories and their role
- Cable failures and installation practices
- Detection of faults

Basic theory

- Construction
- Conductor materials and configurations
- Insulation materials
- Use of screen in HV cables
- Use of armor for ground continuity and mechanical protection
- Special and single core cables
- Voltage rating
- Stress distribution in single core and multi-core power cables
- Electrical breakdown of insulating materials
- HV cables using XLPE insulation
- Treeing in XLPE and need for end sealing of cables
- Manufacturing process
- Standards for cables

Selection of Cables & Installation

- Criteria for selection
- Cable sizing
- Installation - Directly buried
- Installation - Conduits
- Installation on structures

Joints & Terminations

- Basic approach
- Broad classification
- Comparative merits
- Pre-fabricated
- Site fabricated
- Additional requirements of outdoor terminations
- Reconstitution of cable properties
- Special joints
- Mechanical protection
- Stress control

Jointing & Terminations practice

- Kits for joints and terminations
- Shelf life issues
- Matching diameter of insulated conductor with kit specifications in pre-fabricated kits
- Preparation of cable
- Connection
- Reconstitution of cable properties
- Continuity and earthing aspects
- Sealing
- Healthiness
- Installation aspects for joints

Commissioning & periodic Testing

- Review of codes for testing requirements
- Drum length checks
- Post installation checking
- Pre-commissioning and periodic tests
- Tests as tools for condition monitoring and early failure alarm
- HV tests using DC and very low frequency AC
- Partial discharge tests and mapping of results
- Dielectric dissipation factor measurements
- Micro destructive and non-destructive tests for life assessment
- Operation and maintenance of cables.