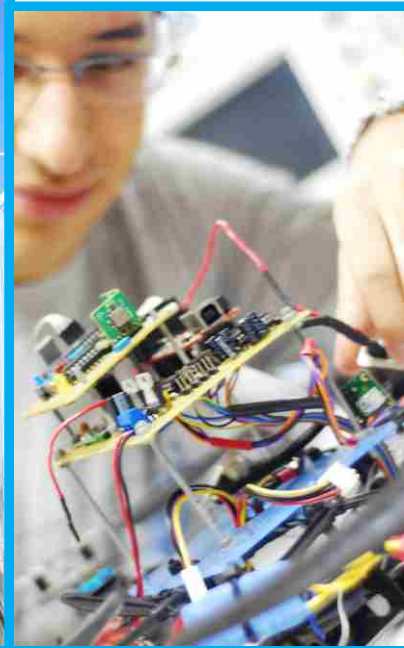
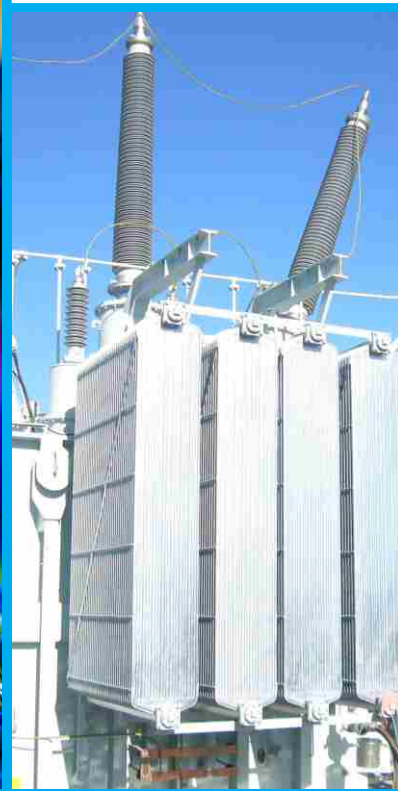


POWER CABLES: OPERATION, MAINTENANCE, LOCATION AND FAULT DETECTION



What You Will Learn...

- ▶ Overview of EPC industry and requirement of electrical systems Design.
- ▶ Role of Electrical Design Engineer in Industry.
- ▶ Knowing Client requirements & collection of specific data for projects.
- ▶ Understanding various phases of projects.
- ▶ Use of International Standards, Design Basis, std. practices/procedure and specifications
- ▶ Estimation of Plant Electrical Load.
- ▶ Development of Single Line Diagrams (SLD) and Control Schematics.
- ▶ Selection, sizing, protection, specification, data-sheets of Electrical Equipments.
- ▶ Cable Selection and Sizing and Routing.
- ▶ Illumination Design.
- ▶ Earthing & Lightning Protection Design.
- ▶ Hazardous Area Classification.
- ▶ Substation/switchyard design.
- ▶ Short Circuit Analysis (Fault Calculations and Stability Studies)
- ▶ Load Flow Analysis
- ▶ Motor Starting Study

SmartBrains Oil and Energy Institute provides premium training courses for energy industry executives and fresh engineering graduates. Our success and distinguished reputation is thanks to our commitment to provide first-class programmes to our clients. Combining leading professionals from across the industry as lecturers and an interactive, practical format, the lessons learnt in a SmartBrains for Energy course are directly transferable back to the work place.

Our Strategic Objectives

To be recognized by industry and employers as a highly reputable training organization. Provide dynamic leadership, sound management and excellence in training. Continue to improve our services through quality management processes. Invest in and value our people through professional development activities. Grow our business through innovation and to continue to be financially secure. Be influential in the economic development of the industries we serve nation wise

Our Mission

“To provide quality training and assessment services and to prepare our students for a fulfilling professional career in their chosen industry. We are committed to upholding our values of providing excellence in training”

Course STRUCTURE



“I would like to thanks T&P Team of Smartbrains who helped me to get skill set on Electrical System Design. The learning experience was good and placement is excellent”

Zeeshan Ahmad

Ankit Electrotech Engineers Pvt Ltd, Noida

DAY ONE

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

DAY TWO

JOINTING AND 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

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 AND INSTALLATION

- Criteria for selection
- Cable sizing
- Installation - Directly buried
- Installation - Conduits
- Installation on structures
- Special needs Eg. Bending radii

JOINTS AND 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

Practical Session

COMMISSIONING AND 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
- Practical Session

FAILURE MODES AND FAULT DETECTION

- Types of failures
 - Reasons for failures
 - Fault Location
 - Electrical tests for detection of cable faults
 - Safety issues in fault location
 - Analysis of failures
- Practical Session

NEW TRENDS IN CABLE TECHNOLOGY

- Increasing preference to underground cables
- New technologies for very high capacities and voltages
- EHV XLPE in sub transmission systems
- High temperature superconductivity in cables

Why

SmartBrains?

SmartBrains is the ultimate choice for all the working & non working engineer's in energy Sector training requirements. Our extensive portfolio of energy training courses are:

- ▶ 100% focused on the Oil and energy industry.
- ▶ Guided by the industry's renowned professionals with unprecedented knowledge of the Oil and energy industry.
- ▶ Highly interactive program with practical and relevant case studies.
- ▶ Training by extensively researched self developed cutting edge techniques.
- ▶ Skill development techniques with comprehensive set of documentation, practical skills and tools used in the Industry.

- ▶ The perfect opportunity to develop network and experiences with knowledge sharing.
- ▶ Internationally acclaimed engineering qualification.
- ▶ Designed for both Fresh engineers and working professionals to attain growth in oil and energy industry.
- ▶ One of the finest international faculty.
- ▶ Interactive, interesting and motivational training sessions.
- ▶ Access to enormous reference books and research materials.

Admission

Requirements

- ▶ Duly Filled Application Form
- ▶ 2 Photographs
- ▶ Photo State of Qualifying Examination
- ▶ Address Proof
- ▶ I.D. Proof
- ▶ Latest Resume

Declaration

- ▶ This training program is on AUTONOMOUS basis conducted by SmartBrains.
- ▶ SmartBrains has right to expel any student at any time for misbehavior, poor attendance without refunding the fees.
- ▶ Certification will be issued only after completion of course, submission of all assignments and passing all the examinations.
- ▶ SmartBrains has its own rules and regulations about conducting examinations and assessment of examinations



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