Power Transformer Diagnostic, Method, Maintenance and Lifetime Extension Course

Venue Information

Venue: London UK

Place:

Start Date: 2026-02-24

End Date: 2026-02-28

Course Details

Net Fee: £4750.00

Duration: 1 Week

Category ID: EAPET

Course Code: EAPET-51

Syllabus

Course Description

The installation of high voltage distribution and transmission equipment has grown rapidly worldwide due to the increasing demand for power. Ensuring the reliable operation of power systems is critical, as failures of key assets like transformers and switchgear can result in enormous costs for plants, factories, and utilities. To minimize risks, personnel working with such equipment must have strong knowledge of both operational requirements and maintenance practices.

This course introduces modern technologies in electrical equipment maintenance and monitoring, while also covering the theory and operation of transformers and switchgear. Participants will gain practical understanding of maintenance procedures, supported by insights and techniques developed by leading electrical engineers worldwide.

- Knowledge of new technologies in equipment maintenance and monitoring
- Understanding of transformer theory, construction, and operation
- Ability to identify and apply various transformer types
- Knowledge of transformer protection methods
- Understanding of transformer oil testing and interpretation
- Familiarity with effective electrical testing of transformers
- Skills to manage transformer breakdowns with minimal disruption
- Understanding of instrument transformers (CT & VT) and their applications
- Knowledge of earthing systems and electrical safety
- Understanding of protection relay types, operation, and maintenance
- Knowledge of circuit breaker types, operation, and maintenance
- Understanding of capacitor banks, cables, and batteries protection and maintenance

Course Outline

New Technologies of Electrical Equipment Maintenance and Monitoring

- Approaches based on mathematical models
- Partial discharge testing and monitoring of insulation
- Insulation resistance test (IR), Megger, PI, DC hi-pot
- Insulation power factor measurement
- On-line measurement of partial discharge activity
- On-line monitoring of transformers (local indications, thermography, PDA)
- Insulating oil properties and tests (dielectric strength, water, acidity, IFT, oil color, power factor)
- Dissolved gas analysis (DGA): sampling, limits, fault gases, trends, continuous monitoring
- Optical cable temperature monitoring and DTS systems

Instrument Transformers (CT & VT)

- Voltage transformer theory, installation, and maintenance
- Current transformer principles, errors, saturation, magnetization curves
- Precautions, ratings, burden calculations
- Installation and testing of CTs and VTs

Transformers

- Fundamentals: theory, classification, and functions
- Operation in power systems

- Transformer oil analysis and quality
- Protection methods

Earthing System and Electrical Safety

- Equipment and system earthing: solid, resistance, reactance
- Unearthed systems and neutral earthing compensators
- Earthing transformers (distribution, zig-zag)
- Lightning arresters
- Electrical hazards: touch/step voltage, shock effects
- Earth leakage and arc flash protection
- Arc flash causes, characteristics, PPE, and risk reduction

Protection Relays

- Basic design and applications of electromechanical relays
- Types: overcurrent, instantaneous, directional, polar, distance, comparison relays
- Transition to digital/microprocessor-based relays
- Testing and maintenance: EMC, safety, environmental, software tests
- Dynamic validation, troubleshooting, commissioning, and production tests

Circuit Breakers

- Arc phenomena and interruption
- Arc extinguishers and control techniques
- Breaking capacity and switchgear duties
- Types and fundamentals of circuit breakers
- Testing and maintenance of HV circuit breakers (type, routine, commissioning)
- Routine maintenance and safety precautions
- Acceptance and maintenance of LV circuit breakers