Training Program:

Condition Monitoring of Power System Equipment

Introduction:

Faced with increased demands and growing competition, many utilities and industries are seeking to maximize the value of their existing assets by leveraging new technologies to optimize Operations and Maintenance activities. One of the most successful maintenance strategies is a conditioned-based approach which utilizes data collected from periodic inspections, testing and predictive maintenance technologies to determine the optimum maintenance requirements. Contrary to the traditional time-based maintenance approach, Condition-based Maintenance is a process, which utilizes monitoring and diagnostic data to drive the maintenance decision process.

Who Should Attend?

This course is specially designed for Engineers and Technologists dealing with Operation, Maintenance & Testing of Switchgears, Cables and Power Transformers.

Methodology

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

Accreditation:

BTS attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.

Objective:

At the end of this course, participants will be able to:

- Understand typical failure modes associated with Cables, Switchgears and Transformers.
- Understand typically used on- and off- line diagnostic tests for condition monitoring of Cables, Switchgears and Transformers.
- Understand the interrelationships of various on- and off- line diagnostic tests.
- Understand the interpretation of test results.

Course Outline

Cable Diagnostics

- Brief overview of types of cables and its accessories.
- Failure modes of cables and its accessories.
- Destructive and off-line tests - HVDC, HVAC, VLF & OSW.
- Non-destructive and off-line tests - PD mapping.
- Non-destructive and off-line tests -RVM and Dielectric Spectroscopy.

- Non-destructive and on-line tests- HFCT, Ultrasonic.
- Case Study Lecture, Discussions & Exercise Power Point

Switchgear Diagnostics

- Brief overview of switchgear construction - VCB & SF6.
- Failure modes of switchgear.
- Hipot test.
- Contact resistance test.
- Insulation resistance test.
- Power factor/ Tan Delta test.
- Timing test.
- On-line tests - Partial Discharge & Thermography.
- Case Study

Transformer Diagnostics

- Brief overview of transformer construction
- Brief overview on oil and paper insulation degradation
- Failure modes of transformer and OLTC.
- OLTC monitoring through motor current signature analysis
- Dissolved Gas Analysis.
- Furan Analysis.

- Degree of Polymerisation test.
- Case Study Lecture, Discussions & Exercise Power Point
- Partial Discharge Analysis - Acoustic and HFCT.
- Off-line tests - PI, Winding resistance, Turns ratio.
- Case Study
- Return Voltage Measurement
- Frequency Response Analysis
- Case Study