MANAGEMENT & MAINTENANCE OF MV & LV SWITCHGEAR

A 2-Day course designed to discuss Application, Installation, Maintenance and Testing issues related to Medium-Voltage Switchgear

Recognised for Continuing Professional Development (CPD) by SAAMA in accordance with ECSA guidelines

Effective Human Intervention
LEADERS IN TRAINING

EHI has been accredited by MERSETA Accreditation No: 17-QA/ACC/0603/11 B-BBEE Level 2

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MV SWITCHGEAR MAINTENANCE

"Ensure that physical assets continue to do what they are expected to do."

Course Synopsis

This two-day medium-voltage switchgear maintenance training course: The will discuss application, installation, maintenance and testing issues related to medium-voltage switchgear including circuit breakers. The course will also make delegates aware of issues concerning the proper application, installation and maintenance of these types of equipment with a strong emphasis on safety.
At the end of the program the delegates will be aware of diagnostic tools that aid the planning of maintenance, understand the changing requirement placed on the system with increasing activities and system fault levels.

Objective of the workshop

- ✓ The material will cover switchgear theory, standards, relating to medium and low voltage switchgear.
- ✓ All aspects of switchgear will be covered as far a practical is concerned
- ✓ Air, oil sf6 and vacuum will be discovered
- ✓ Introduction to power system protection components and systems

Upon completion of this course, participant will be able to:

- Develop a maintenance action plan for switchgear
- Discuss the standard switchgear terminology
- Describe the general classifications of circuit breakers
- Understand arc flash protection for persons
- Understand the importance of fault level at switch boards, protection grading and safe working distance
- Discuss the operation and maintenance of air, vacuum and gas (SF6) circuit breakers
- Identify applicable regulations
- Implement maintenance procedures
- Cut costs and improve safety by taking advantage of the new methods of protection

About Your Facilitator

Ian Mee *(CEM, Pr. Tech.Eng. Pr.Cert.Eng. SM-ICMEE-SA, M SAIEE, M-IPET MIE 00009)*

Ian Mee is registered as a Professional Technologist, Professional Certificated Electrical and Mechanical Engineer and registered as a Master Installation Electrician. He has 50 years of Industrial experience in Electrical, Mechanical and Process Engineering which included chemical, rubber, paper, sugar, shipping and food industries. With over 20 years in the chemical and allied Industrial environment at senior management levels. The last 20 years running a consulting practice. Ian Mee is a registered Assessor for EWSETA and is a SANAS accredited Authorised inspection Body and is recognised by Department of Labour as an AIA (CI 014)

Confirm

Registration Confirmation

Complete your registration form. Receive your invite and confirm your VILT session by clicking on the link in the email invite. Click "Add to calendar" to ensure you do not miss the training course.

Alternatively, a signed In-house quotation will secure your group training session, followed by an invoice and date confirmation.

Who should attend?

This course is suggested for all technical personnel involved with operation, inspection and/or maintenance of switchgear. Anyone who work s in distribution, maintenance and operation switchgear such as: industrial, commercial and distribution systems.

This includes:

- ✓ Maintenance Managers & Engineers
- ✓ Maintenance Supervisors & Technicians
- ✓ Mechanical and Electrical Engineers
- ✓ Engineering managers
- ✓ Field Service Engineers
- ✓ Consultants & Contractors
- ✓ Manufacturers and suppliers

Benefits include:

- Participation in an interactive workshop
- Learn from a recognised expert with cross industry experience
- Comprehensive course documentation
- Certificate of Completion
- 3 CPD Points

Customised Virtual Training and/or In-house Training

If you wish to organize a Virtual Instructor Led Training session or In-House session for your organization, we will custom design a session that will help you achieve your desired learning goal. The main advantage of custom designed VILT, in addition to being significantly cost effective, is that they address topics specifically related to the needs of your organization. **To discuss the possibility of designing and conducting such a session or In-House training session, contact us on 021 979 5891 or callie@ehiafrica.co.za for a comprehensive quotation.**

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MV SWITCHGEAR MAINTENANCE

DAY ONE

Session 1:
Types of Switchgear and electrical Systems
Occupational Health and Safety Act 85 of 1993 and regulations
Management of electrical switchgear

- What is switch gear?
- What are the hazards?
- Arc flash and ratings
- Why maintain equipment
- Single line diagrams and load switching requirements
- MCB's, air-break, oil, vacuum and SF5 switchgear – the differences
- Fused devices, contractors and fault clearing switches
- Ring main unit and system configuration
- Functions of protection CT's and VT's and relays
- Earthing for safety and earth fault conditions
- Switchgear inspection – Field tests for equipment condition?

GROUP ACTIVITY

Session 2:
Applications and Operation

- Electrical arcs and contact erosion
- Contact systems – self-cleaning – magnetic forces
- Operation of modern switchgear – air, vacuum and SF6
- Measurement of contact resistance – maintenance of contact systems.
- Switchgear associated with disconnections
- Operating mechanisms – spring charging – magnetic solenoids
- Switchgear ancillaries
- Overvoltage protection – surge arrestors – outdoor and indoor

GROUP ACTIVITY

Session 3
MV Switchgear and Circuit Breakers

- Types of circuit breakers
- Applications
- Design Criteria
- Definition of ratings of circuit breakers
- Medium voltage circuit breaker interrupting media
- Standards and methods of testing

GROUP ACTIVITY

- What is switch gear?
- What are the hazards?
- Arc flash and ratings
- Applicable standards
- Actors effecting Selection of switchgear
- Classification of Current transformers
- Potential transformers
- Capacitor voltage transformers
- Relay and circuit breaker connections
- Single line diagrams
- Schematic diagrams
- Maintenance of switchgear
- Mechanical interlocks and components
- Installation of circuit breakers

Session 4
Metal Enclosed and Metal Clad Switchgear

- Classification of switchgear assemblies
- Detailed review and ANSI standards
- Load break switches, ratings, dimensions, construction feature, current limiting and expulsion – fuses
- Metal enclosed circuit breaker switchgear
- Dimensions and construction features
- Applicable standards
- Actors effecting Selection of switchgear
- Classification of Current transformers
- Potential transformers

GROUP ACTIVITY

DAY TWO

Session 5
MV Switchgear Installations Commissioning

- Selection criteria for primary installations
- Gas Insulated switchgear SF6 for medium voltage
- Monitoring systems and alarms – SF6, Gas, Air
- Relay and circuit breaker connections
- Single line diagrams
- Schematic diagrams

GROUP ACTIVITY

Session 6
Life Extension of MV Switchgear Equipment

- Typical problems and field enemies
- Underlying causes of any failure and means of eradicating them
- Tracking phenomenon and how to cease it
- Maintenance of switchgear
- Mechanical interlocks and components
- Installation of circuit breakers
- Routine inspections
- Record keeping

GROUP ACTIVITY

Session 7
Maintenance Best Practices and Routine Conditions Monitoring

- Switchgear inspection methodologies
- Arc fault protection
- Mechanical, mal-operation, partial discharge activity and others
- Detecting the onset of partial discharge activity
- Timing tests of equipment
- Thermography – how this can spot trouble fast
- Safety approach to testing
- Oil circuit breakers
- Operation of bulk oil
- Operation of minimum oil
- Properties of oil for breakers and switchgear

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SAAMA

Saiosh South African Institute of Occupational Safety and Health
Corporate Member

merSETA
MANUFACTURING, ENGINEERING AND RELATED SERVICES SETA

T.E.T.A Transport Education Training Authority
Heart of Skills Innovation