

## COURSE OVERVIEW EE0112-4D ABB 11kV Distribution Switchgear

**Course Title**

ABB 11kV Distribution Switchgear

**Course Date/Venue**

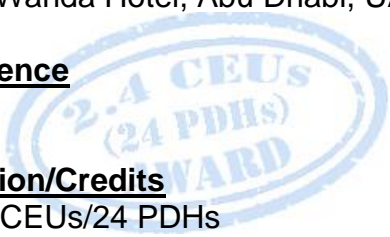
October 21-24, 2024/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

**Course Reference**

EE0112-4D

**Course Duration/Credits**

Four days/2.4 CEUs/24 PDHs



**Course Description**



***This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.***



This course is designed to provide participants with a detailed and up-to-date overview of ABB 11kV electrical safety. It covers the voltage convention, fundamentals of circuit breakers, types of breakers, construction, ratings and tripping characteristics; the ABB switchgear in a network context; the ABB switchgear in historical perspective and ABB switchgear details; the ABB power circuit breakers, reclosers, sectionalizers, surge arresters and ABB main unit; the ABB metal clad switchgear; the ABB instrument and control power transformers; and the ABB 11kV distribution switchgear relaying system.



During this interactive course, participants will learn the general control and metering, control devices and wiring; the ABB 11kV distribution switchgear comprising of nameplates and testing; the ABB switchgear asset management; the testing codes and standards, test requirements and component testing procedures; the circuit breaker diagnostic techniques; the distribution switchgear commissioning and start-up, acceptance and hand over; and the switchgear vital equipments covering batteries condition and monitoring.

### Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a comprehensive knowledge on ABB 11kV distribution switchgear
- Discuss voltage convention, fundamentals of circuit breakers, types of breakers, construction, ratings and tripping characteristics
- Explain ABB switchgear in a network context, ABB switchgear in historical perspective and ABB switchgear details
- Identify ABB power circuit breakers, reclosers, sectionalizers, surge arresters, ABB main unit, ABB metal clad switchgear, ABB instrument and control power transformers
- Illustrate ABB 11kV distribution switchgear relaying system, general control and metering, control devices and wiring as well as ABB 11kV distribution switchgear comprising of nameplates and testing
- Carryout ABB switchgear asset management, testing codes and standards, test requirements and component testing procedures
- Employ circuit breaker diagnostic techniques, distribution switchgear commissioning and start-up, acceptance and hand over
- Recognize switchgear vital equipments covering batteries condition and monitoring

### Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

### Who Should Attend

This course provides an overview of all significant aspects and considerations of ABB 11kV distribution switchgear for electrical engineers, industrial and utility engineers and other technical staff.

### Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos


In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

### Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

### Certificate Accreditations

Certificates are accreditation by the following international accreditation organizations:

- 
The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **2.4 CEUs** (Continuing Education Units) or **24 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- 
British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

### Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

**Course Instructor(s)**

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



**Mr. Steve Mark, PE, MSc (on-going), BSc, is a Senior Electrical & Telecommunications Engineer with over 20 years of extensive experience within the Oil & Gas, Petrochemical and Power industries specializing in IT Disaster Recovery & Planning, IT Risk Management Concepts, IT Risk Management Standard Approaches, IT Risk Management Planning, IT Risk Identification, E-Communication & Collaboration Skills, Virtual Communication, Social Networking, Business Intelligence Tools, Certified Electrical Safety Compliance Professional, Overhead Power Line Maintenance Patrolling & Washing, Energy Transmission & Distribution, Transmission Line Structures, Insulators & Accessories, Transmission Line Construction & Maintenance, Insulated Power Cables, High Voltage Applications, Transmission Line Parameters, Sag & Tension of Conductor, Geomagnetic Disturbances, Reactive Power Compensation, Overhead Line Troubleshooting, Patrolling, Troubleshooting Safety, HV/LV Equipment, High Voltage Electrical Safety, LV & HV Electrical System, HV Equipments Inspection & Maintenance, HV Switchgear Operation & Maintenance, LV Distribution Switchgear & Equipment, Basic Electricity, Electrical & Special Hazards, Personnel Protection, Motor Controllers, Electrical Switching Practices, Emergency Planning, Safety Management, Earthing & Bonding Installation, Energized & De-Energized Work, Protection Relays, Testing & Commissioning, Lock & Tag Out, Circuit Breakers & Switchgears, Portable Cables, Transformers, Surge Arrestors, Isolators & Fuses, Capacitor Banks, Earth & Shunt Reactors, Gas Insulated Substations (GIS), HV Substation Inspection & Reporting, HV Cable Design, HV Electrical System Commissioning, HV Equipments Inspection & Maintenance, UPS & Generators, Electrical Installations Design & Construction, Electrical Mechanical Installations, GIS Substations, GE Turbine Power Plant and Steam Power Plants. Further, he is also well-versed in Network & System Administration, Data/Voice Networking, Network Capacity Calculations, VPN Connection Implementation, Structured Cabling Constructions, Engineering Design, Security Installations Design & Implementation, Logistics Management, IT Analysis, Business Continuity Plan Design, Disaster Recovery Simulations, Supply Chain System Design, Barcode Marking & RFID Applications. He is currently the **Lead Electrical Engineer** of Public Power Corporation S.A wherein he is responsible for site manufacturing supervision of works and electrical maintenance support for the existing Steam Electrical Power Plant.**

During his career life, Mr. Mark has gained his expertise and thorough practical experience through handling challenging positions such as being the **IT & Telecommunications Manager, IT & Organization Manager, Logistics Manager, Electrical Engineer, Safety Engineer, Public Works Contractor, IT Support Analyst, Project Supervisor, Systems & Network Administrator, Data Protection Officer, Shop Auditor and Amateur Radio Operator** for various multi-national companies and institutes.

Mr. Mark is a **Registered Professional Engineer**, has a Bachelor degree in **Electrical Engineering** from the **Technical University of Halkida, Euboea, Greece** and currently enrolled for **Master** degree in **Quality Management** from the **Hellenic Open University**. Further, he is a **Certified Instructor/Trainer**, a **Certified Safety Engineer** and a **Certified Data Protection Officer (DPO)**. Moreover, he is a member of Scientific Society of Technological Education of Engineers (EETEM) and has delivered numerous trainings, courses, seminars, workshops and conferences internationally.

### **Course Fee**

**US\$ 4,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

### **Course Program**

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

#### **Day 1: Monday, 21<sup>st</sup> of October 2024**

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Introduction</b> Voltage Convention • Fundamentals of Circuit Breakers • Types of Breakers, Construction • Ratings, Tripping Characteristics
0930 – 0945	Break
0945 – 1030	<b>ABB Switchgear in a Network Context</b> Basic Construction • Safety • Single Line • Utilization
1030 – 1115	<b>ABB Switchgear in Historical Perspective</b> Oil Circuit Breakers • Air Blast CB • SF6 and Vacuum CB • Operating Mechanisms
1115 – 1215	<b>ABB Switchgear Details</b> Ratings Ur, Ik, Ip, Va • Degree of Protection • Service Conditions • Ancillary Equipment
1215 – 1230	Break
1230 – 1420	<b>ABB Power Circuit Breakers</b> Moulded Case Circuit Breakers • Low-voltage Circuit Breakers • Medium-voltage Circuit Breakers
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day One

#### **Day 2: Tuesday, 22<sup>nd</sup> of October 2024**

0730 – 0830	<b>Reclosers</b>
0830 – 0930	<b>Sectionalizers</b>
0930 – 0945	Break
0945 – 1030	<b>Surge Arresters</b>
1030 – 1130	<b>ABB Ring Main Unit</b>
1130 – 1230	<b>ABB Metal Clad Switchgear</b>
1230 – 1245	Break
1245 – 1420	<b>ABB Instrument &amp; Control Power Transformers</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Two

#### **Day 3: Wednesday, 23<sup>rd</sup> of October 2024**

0730 – 0830	<b>ABB 11kV Distribution Switchgear Relaying System</b>
0830 – 0930	<b>ABB 11kV Distribution Switchgear General Control &amp; Metering</b>
0930 – 0945	Break
0945 – 1030	<b>ABB 11kV Distribution Switchgear Control Devices &amp; Wiring</b>

1030 – 1130	<b>ABB 11kV Distribution Switchgear</b> Nameplates • Testing
1130 – 1230	<b>ABB Switchgear Asset Management</b> Equipment Register • CBM and RCM Process • Switchgear Diagnostic Techniques • Tripping Devices & Maintenance & Testing
1230 - 1245	Break
1245 – 1420	<b>Testing Codes &amp; Standards</b> Management of Commissioning Projects • About NETA • Certification of Test Technicians • Certification Test Examples • NETA – ANSI Standards • NETA – Frequency of Tests • ANSI IEC 62337 • NEC 2011
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Three

**Day 4: Thursday, 24<sup>th</sup> of October 2024**

0730 – 0830	<b>Test Requirements</b> Development of Test Regime • Outline of Typical Tests • Interpretation of Test Results • Troubleshooting
0830 – 0930	<b>Component Testing Procedures</b> Types of Commonly Used Test Equipment • Insulation Resistance Testing • Contact Resistance Testing • Current Injections, CT Testing • DC Voltage Testing Techniques • AC Voltage Testing Techniques
0930 – 0945	Break
0945 – 1030	<b>Circuit Breaker Diagnostic Techniques</b> Diagnostic Techniques • Maintenance Procedures for Medium-voltage Oil Circuit Breakers • Maintenance Procedures for Medium-voltage Vacuum Circuit Breakers • Recommended Annual Maintenance
1030 – 1115	<b>Distribution Switchgear Commissioning</b> Capacitors • Current Transformers • Instrument Transformers, Test Switches, Metering & Relaying Devices • NETA Recommended Acceptance Test
1115 - 1215	<b>Start-up, Acceptance &amp; Hand Over</b> Systems & Their Integration • Energizing Sequence • Safety Considerations • Load Checks • Documentation • Correction of Defects • Spare Parts • Warranty • Final Acceptance • Training for Operations & Maintenance Personnel
1215 – 1230	Break
1230 – 1345	<b>Switchgear Vital Equipments</b> Batteries Condition & Monitoring • Discussions
1345 – 1400	<b>Course Conclusion</b>
1400 – 1415	<b>POST-TEST</b>
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

**Simulators (Practical Sessions)**

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art “GE Multilin Relay 469” and “GE Multilin Relay 750”.



**GE Multilin Relay 469 Simulator**



**GE Multilin Relay 750 Simulator**

**Course Coordinator**

Mari Nakintu, Tel: +971 2 30 91 714, Email: [mari1@haward.org](mailto:mari1@haward.org)