COURSE OVERVIEW EE1156
Electrical Isolation and De-Isolation Requirements for Electrical Switchgears

Course Title
Electrical Isolation and De-Isolation Requirements for Electrical Switchgears

Course Date/Venue
July 28-August 01, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
EE1156

Course Duration/Credits
Five days/3.0 CEUs/30 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 Electrical Isolation and De-Isolation Requirements for Electrical Switchgears. It covers the electrical isolation and de-isolation, electrical switchgears, energy sources and isolation requirements and standards and legal framework; the purpose and importance of risk assessments, risk assessment process, hazard identification specific to switchgears and risk control measures; the lockout/tagout (LOTO) principles, isolation devices in switchgears and step-by-step isolation process; and the de-isolation process and testing for dead (proving dead).

Further the course will also discuss the personal protective equipment (PPE) for isolation tasks and safe access to electrical equipment; the safety precautions during isolation, human factors in isolation activities, documentation and isolation registers; the coordination of isolation in multi-discipline environments; the emergency situations during isolation and supervisor and authorized person roles; the isolation in low, medium and high voltage systems; the interlocking schemes and safety interlocks; and the common failures and near misses in isolation activities and permit to work (PTW) integration with isolation.

During this interactive course, participants will learn the inspection and maintenance of isolation equipment; the isolation during maintenance and repair activities and isolation procedure; the inspection checklists, documentation, corrective actions and follow-up; the external workforce, responsibilities during isolation and communication and supervision requirements; the isolation procedures and breaches in isolation; and the immediate corrective action steps, escalation procedures and post-incident review.

Course Objectives

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

- Apply and gain an in-depth knowledge on electrical isolation and de-isolation requirements for electrical switchgears
- Discuss electrical isolation and de-isolation, electrical switchgears, energy sources and isolation requirements and standards and legal framework
- Explain the purpose and importance of risk assessments and apply risk assessment process, hazard identification specific to switchgears and risk control measures
- Interpret lockout/tagout (LOTO) principles, isolation devices in switchgears and step-by-step isolation process
- Carryout de-isolation process, testing for dead (proving dead), personal protective equipment (PPE) for isolation tasks and safe access to electrical equipment
- Employ safety precautions during isolation, human factors in isolation activities, documentation and isolation registers and coordination of isolation in multi-discipline environments
- Assess emergency situations during isolation and recognize supervisor and authorized person roles as well as isolation in low, medium and high voltage systems
- Determine interlocking schemes and safety interlocks, common failures and near misses in isolation activities and permit to work (PTW) integration with isolation
- Apply inspection and maintenance of isolation equipment, isolation during maintenance and repair activities and isolation procedure
- Review inspection checklists, and documentation and apply corrective actions and follow-up
- Manage external workforce, responsibilities during isolation and communication and supervision requirements
- Update isolation procedures, identify breaches in isolation and apply immediate corrective action steps, escalation procedures and post-incident review

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 conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of electrical isolation and de-isolation requirements for electrical engineers, operations and production supervisors, maintenance and reliability engineers, HSE officers and safety coordinators, commissioning and shutdown teams as well as supervisors managing LV and HV switchgear systems.

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

Haward's certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

- 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 **3.0 CEUs** (Continuing Education Units) or **30 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.

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. Taiseer Ali, MSc, BSc, is a **Senior Electrical & Telecommunications Engineer** with over **30 years** of extensive experience and academic experience as a **University Professor** specializing in **Power System Protection and Relaying**, **Power Distribution**, **HV/LV Equipment**, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipments Inspection & Maintenance**, **HV Switchgear Operation & Maintenance**, **LV Distribution Switchgear & Equipment**, **Lock & Tag Out**, **Circuit Breakers & Switchgears**, Portable **Cables**, **Transformers**, Gas Insulated Substations (**GIS**), **HV Substation Inspection & Reporting**, **HV Cable Design**, **HV Electrical System Commissioning**, **HV Equipments Inspection & Maintenance**, Electrical Signal Analysis (**ESA**), **Electrical Equipment Circuits**, **Wiring & Testing**, **Electronic Circuits**, Electrostatic Discharge (**ESD**), Distributed Control System (**DCS**) Applications & Troubleshooting, **SCADA & Industrial Communication**, Process Logic Controller (**PLC**), **Load Flow** Calculation, **Cable** Installation, **Transformer** Maintenance, **Electrical** Safety, **Electrical** Drawing, **Power Generation & Transmission**, **Power Distribution & Network**, **Protection Relays**, **Electrical** Troubleshooting, **Earthing**, **Bonding**, **Lightning & Surge Protection**, **UPS & Battery**, **Instrumentation & Control**, **Process Control & Instrumentation**, **Industrial Communication**, **Flow** Measurement, **Level** Measurement, **Temperature & Vibration** Measurement, **Measurement** Instrumentation, **Pressure** Measurement, **Analytical** Instrumentation, **Calibration & Testing** Procedures, Final Control Elements, **Control Loops** Operation, **Control Panels**, **Power Generation**, **Power Transformers**, **Uninterruptible Power Systems** (**UPS**), **Battery Chargers**, **AC** & **DC Transmission**, **Distribution Network**, **Grid Input Assessment**, Load Flow, Short Circuit, Smart Grid, Grounding, **Electrical Equipment**, **Electrical Motors** & **Drives**, Power System Harmonics, **Electrical Substation Design**, **Power Cable Testing & Fault Location**, **Circuit Breakers & Switchgears**, Electrical Distribution Design, Installation & Commissioning and **HVDC Transmission** & **Control**, Advanced Networking, Datron Maintenance, Cisco Internet, Data Base Access, Advanced Computer, AutoCAD, Standard Radio Devices, Advanced Calibration, Repair and Maintenance of VHF Portable Role, Combat Vehicle Reconnaissance 76mm and Target Engagement Using Simulaser.

During his career life, Mr. Taiseer has gained his expertise and thorough practical experience through handling challenging positions such as being the **Head of the Command Control & Communication Department**, **Head of the Academic and Technical Branch**, **Chief of the Frequency Branch**, **Commander**, **Electrical Engineer**, **Spectrum Management Engineer**, **Safety Engineer**, **Engineering Manager**, **Electrical Engineering Head**, **Quality Control Department Head**, **Engineering Supervisor** and **Lecturer/Instructor** for various companies and universities such as the Yarmouk University, C3 Directorate, JAF C3 Communication Workshops, Jordan Armed Forces Joint Officer and Military Communication College and multi-national companies and institutes.

Mr. Taiseer has a **Master's** degree in **Industrial Engineering/Engineering Management** and a **Bachelor** degree in **Electrical/Communication Engineering**. Further, he is a **Certified Instructor/Trainer** and delivered various trainings internally in his previous companies.

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 Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

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, 28th of July 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Electrical Isolation & De-Isolation*** *Definition & Objectives of Isolation & De-Isolation • Importance in Maintenance & Operation • Regulatory Requirements & Industry Standards • Common Risks & Hazards*
0930 – 0945	*Break*
0945 – 1045	***Overview of Electrical Switchgears*** *Types of Switchgear (LV, MV, HV) • Key Components (CBs, Disconnectors, Fuses, Relays) • Functions & Applications • Typical Configurations*
1045 – 1145	***Energy Sources & Isolation Requirements*** *Electrical Energy Sources in Switchgear Systems • Identification of Isolation Points • Stored Energy Hazards (Capacitors, Springs, etc.) • Procedures for Complete Isolation*
1145 – 1230	***Standards & Legal Framework*** *IEC, NFPA 70E & OSHA Standards • Employer & Worker Responsibilities • Documentation Requirements • Permits to Work (PTW)*
1230 – 1245	*Break*
1245 – 1330	***Risk Assessment Prior to Isolation***

	Purpose & Importance of Risk Assessments • Steps in Risk Assessment Process • Hazard Identification Specific to Switchgears • Risk Control Measures
1330 – 1420	***Lockout/Tagout (LOTO) Principles*** *Overview of LOTO Procedures • Devices Used for LOTO • Application of Tags & Locks • Ensuring Zero-Energy State*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: Tuesday, 29th of July 2025

0730 – 0830	***Isolation Devices in Switchgears*** *Circuit Breakers as Isolation Devices • Disconnectors & Isolators • Fuses & Links • Interlocking Mechanisms*
0830 – 0930	***Step-by-Step Isolation Process*** *Pre-Isolation Checks • Verification of Equipment Identity • Isolation Sequence • Verification of De-Energization*
0930 – 0945	*Break*
0945 – 1100	***De-Isolation Process*** *Verification Before Re-Energization • Removal of Locks & Tags • Communication Requirements • Recording & Handover*
1100 – 1230	***Testing for Dead (Proving Dead)*** *Test Instruments & Calibration • Procedures for Proving Dead • Live-Dead-Live Test Method • Safety Precautions During Testing*
1230 – 1245	*Break*
1245 – 1330	***Personal Protective Equipment (PPE) for Isolation Tasks*** *Categories of PPE • Arc Flash Protection • Insulating Gloves & Tools • Inspection & Maintenance of PPE*
1330 – 1420	***Safe Access to Electrical Equipment*** *Working Clearances • Barriers & Guards • Lighting & Environmental Factors • Working Near Exposed Live Parts*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: Wednesday, 30th of July 2025

0730 – 0830	***Safety Precautions During Isolation*** *Isolation Boundary Setting • Identification of Adjacent Live Equipment • Barriers & Signage • Monitoring Work Zones*
0830 – 0930	***Human Factors in Isolation Activities*** *Importance of Competence & Training • Common Human Errors • Communication Challenges • Reducing Error Likelihood*
0930 – 0945	*Break*

0945 – 1100	***Documentation & Isolation Registers*** *Isolation Certificates • Isolation Plans & Drawings • Isolation Point Numbering • Handover Logs*
1100 – 1230	***Coordination of Isolation in Multi-Discipline Environments*** *Interfaces Between Electrical & Mechanical Isolation • Communication Between Teams • Managing Simultaneous Operations (SIMOPS) • Supervisory Responsibilities*
1230 – 1245	*Break*
1245 – 1330	***Emergency Situations During Isolation*** *Loss of Isolation Integrity • Faulty Equipment During Isolation • Reporting & Investigation Procedures • Restoration of Safe State*
1330 – 1420	***Supervisor & Authorized Person Roles*** *Role Definitions • Authorization Process • Competency Verification • Supervisor Responsibilities During Isolation Work*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4: ***Thursday, 31st of July 2025***

0730 – 0830	***Isolation in Low, Medium & High Voltage Systems*** *Differences in Requirements & Risks • Isolation Techniques per Voltage Level • Specialized Equipment • Additional Precautions for HV Systems*
0830 – 0930	***Interlocking Schemes & Safety Interlocks*** *Purpose of Interlocks • Types of Interlocks (Mechanical, Electrical) • Typical Interlocking Arrangements • Testing Interlocks Before Isolation*
0930 – 0945	*Break*
0945 – 1100	***Common Failures & Near Misses in Isolation Activities*** *Analysis of Industry Case Studies • Root Causes of Failures • Lessons Learned • Implementing Preventive Measures*
1100 – 1230	***Permit to Work (PTW) Integration with Isolation*** *PTW Process Overview • Cross-Reference with Isolation Certificate • Supervisory Verification • PTW Closure Protocols*
1230 – 1245	*Break*
1245 – 1330	***Inspection & Maintenance of Isolation Equipment*** *Routine Inspections • Testing Requirements • Record Keeping • Replacement & Upgrade Criteria*
1330 – 1420	***Isolation During Maintenance & Repair Activities*** *Isolation for Maintenance versus Inspection • Isolation for Repairs & Modifications • Managing Long-Duration Isolation • Verification Before Re-Energization*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5: ***Friday, 01st of August 2025***

0730 – 0830	***Isolation Procedure*** *Review of Isolation Steps • Practical Exercise Scenarios • Site Walkthrough Methodology • Common Pitfalls During Execution*
0830 – 0930	***Audit & Verification of Isolation Compliance*** *Audit Objectives & Scope • Inspection Checklists • Review of Documentation • Corrective Actions & Follow-Up*
0930 – 0945	*Break*
0945 – 1100	***Roles of Contractors & Third-Party Vendors*** *Managing External Workforce • Responsibilities During Isolation • Permit Holder versus Authorized Person Duties • Communication & Supervision Requirements*
1100 – 1215	***Continuous Improvement in Isolation Practices*** *Capturing Lessons Learned • Feedback Mechanisms • Updating Isolation Procedures • Training & Refresher Program Requirements*
1215 – 1230	*Break*
1230 – 1345	***Emergency Recovery After Improper Isolation*** *Identifying Breaches in Isolation • Immediate Corrective Action Steps • Escalation Procedures • Post-Incident Review*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

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 “Switchgear Simulator”, “GE Multilin Relay 469” and “GE Multilin Relay 750”.

Switchgear Simulator

Switchgear Simulator

GE Multilin Relay 469 Simulator

GE Multilin Relay 750 Simulator

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org