

COURSE OVERVIEW EE1119-3D

Electrical and Instrumentation Equipment Precaution, Selection and Application in Hazardous Atmosphere

Course Title

Electrical and Instrumentation Equipment Precaution, Selection and Application in Hazardous Atmosphere

Course Reference

EE1119-3D

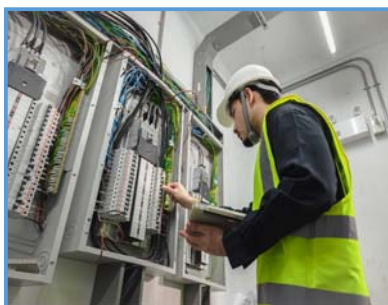
Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	May 19-21, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	July 13-15, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	September 21-23, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	November 17-19, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

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 and Instrumentation Equipment Precaution, Selection and Application in Hazardous Atmosphere. It covers the classification, types and standards of hazardous atmospheres; the electrical safety in hazardous environments and types of electrical equipment used in hazardous areas; the hazardous location standards and certifications; the electrical installation considerations in hazardous zones, risk analysis and assessment techniques; and the instrumentation for hazardous areas and intrinsic safety and explosion protection techniques.

During this interactive course, participants will learn the explosion protection concepts and electrical and instrumentation equipment; the preventive maintenance of electrical and instrumentation equipment; the best practices for electrical and instrumentation installations; troubleshooting electrical and instrumentation equipment in hazardous zones; the advanced explosion protection methods; the innovations in hazardous location equipment; training and competency for working in hazardous atmospheres; and the future trends and regulations in hazardous atmosphere equipment.

Course Objectives

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

- Apply and gain an in-depth knowledge on electrical and instrumentation equipment precaution, selection and application in hazardous atmosphere
- Classify hazardous zones, types of hazardous atmospheres and standards for hazardous areas
- Carryout electrical safety in hazardous environments and identify types of electrical equipment used in hazardous areas, hazardous location standards and certifications
- Apply electrical installation considerations in hazardous zones, risk analysis and assessment techniques
- Recognize instrumentation for hazardous areas and apply intrinsic safety and explosion protection techniques
- Discuss explosion protection concepts and select electrical and instrumentation equipment
- Employ preventive maintenance of electrical and instrumentation equipment and best practices for electrical and instrumentation installations
- Troubleshoot electrical and instrumentation equipment in hazardous zones and apply advanced explosion protection methods
- Discuss innovations in hazardous location equipment, develop training and competency for working in hazardous atmospheres and identify the future trends and regulations in hazardous atmosphere equipment

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 and instrumentation equipment precaution, selection and application in hazardous atmosphere for electrical engineers, instrumentation engineers, project engineers, process and safety engineers, maintenance supervisors, HSE (health, safety, and environment) officers, inspection and compliance personnel, operations personnel working in hazardous facilities, procurement specialists, consultants and auditors and other technical staff.

Accommodation

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

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 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**. 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.

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.

- 
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.

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.

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. Pan Marave, PE, MSc, BEng, is a **Senior Electrical & Instrumentation Engineer** with over **40 years** of extensive experience in **Oil, Gas, Petrochemical, Refinery & Power** industries. His expertise includes **CEMS Operations and Maintenance, ABB 11KV Distribution Switchgear, Operation & Maintenance of Rotork make MOVS, Maintaining Instrument Air Compressors, Circuit Breaker, HV Switchgear Maintenance, HV/LV Electrical Authorisation, Basic Electricity, Electrical & Special Hazards, Personnel Protection, HV/LV Equipment, Motor Controllers, Electrical Switching Practices, Emergency Planning, Safety Management, Safety Instrumented Systems (SIS), Safety Integrity Level (SIL), Emergency Shutdown (ESD); DCS, SCADA & PLC; Measurement (Flow, Temperature, Pressure); Process Analyzers & Analytical Instrumentation; Process Control, Instrumentation & Safeguarding; Process Controller, Control Loop & Valve Tuning; Industrial Distribution Systems; Industrial Control & Control Systems, Power Systems Protection & Relaying; Earthing, Bonding, Grounding, Lightning & Surge Protection; Electric Power Substation & Systems; Electrical Engineering Principles; Motor Control Circuit; Electrical Fault Analysis; Electrical Networks & Distribution Cables; Circuit Breakers, Switchgears, Transformers, Hazardous Areas Classification and Detailed Engineering Drawings, Codes & Standards**. Furthermore, he is also well-versed in Microprocessors Structure, Lead Auditor (ISO 9000:2000), ISO 9002, Quality Assurance, and Projects & Contracts Management.

Presently, Mr. Marave is the **Technical Advisor** of **Chamber of Industry & Commerce** in Greece. Prior to this, he gained his thorough practical experience through several positions as the **Technical Instructor, Engineering Manager, Electronics & Instruments Head, Electrical, Electronics & Instruments Maintenance Superintendent, Assistant General Technical Manager** and **Engineering Supervisor** of various international companies such as the **Alumil Mylonas, Athens Papermill, Astropol** and the **Science Technical Education**.

Mr. Marave is a **Registered Professional Engineer** and has **Master's** and **Bachelor's** degrees in **Electrical Engineering** from the **Polytechnic Institute of New York** and **Pratt Institute of New York (USA)** respectively. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and an active member of the **Technical Chamber** and the **Institute of Electrical and Electronics Engineer (IEEE)** in Greece. He has presented and delivered **numerous international** courses, conferences, trainings and workshops worldwide.

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 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

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Hazardous Areas Definition of Hazardous Areas • Classifications of Hazardous Zones (Zone 0, Zone 1, Zone 2) • Types of Hazardous Atmospheres (Gas, Dust, etc.) • Standards for Hazardous Areas (IEC, NEC, ATEX)
0930 – 0945	Break
0945 – 1045	Electrical Safety in Hazardous Environments Importance of Electrical Safety • Risk Assessment for Electrical Installations in Hazardous Areas • Types of Electrical Hazards (Electrical Shock, Arc Flash) • Protective Measures and Safety Practices
1045 – 1145	Types of Electrical Equipment Used in Hazardous Areas Explosion-Proof Equipment • Intrinsically Safe Equipment • Flameproof and Purged Systems • Benefits and Limitations of Each Type
1145 – 1230	Hazardous Location Standards & Certifications International Standards (IECEx, ATEX, NEC) • Importance of Certification and Compliance • Key Components of Certified Equipment • Case Studies on Certification Failures
1230 – 1245	Break
1245 – 1330	Electrical Installation Considerations in Hazardous Zones Installation Methods and Considerations • Cables and Wiring Selection • Grounding and Bonding Principles • Explosion Protection Techniques
1330 – 1420	Risk Analysis & Assessment Techniques Hazard and Operability Study (HAZOP) • Failure Modes and Effects Analysis (FMEA) • Fault Tree Analysis (FTA) • Risk Analysis for Electrical Systems in Hazardous Zones
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

0730 – 0830	Instrumentation for Hazardous Areas Types of Instrumentation Used (Pressure, Temperature, Level, Flow) • Criteria for Selecting Instrumentation in Hazardous Zones • Challenges in Measuring and Controlling Parameters • Integration of Instrumentation with Control Systems
0830 – 0930	Intrinsic Safety & Explosion Protection Techniques Definition and Principles of Intrinsic Safety (IS) • Components of Intrinsically Safe Circuits • Zener Barrier and Galvanic Isolator Designs • Intrinsically Safe Systems in Control and Instrumentation
0930 - 0945	Break
0945 – 1130	Explosion Protection Concepts Overview of Explosion Protection Techniques (Flameproof, Pressurization) • Electrical and Instrumentation Protection Methods • Electrical Isolation and Bonding for Explosion Protection • Case Studies of Explosions and Lessons Learned
1130 - 1230	Selection of Electrical & Instrumentation Equipment Factors to Consider for Equipment Selection in Hazardous Areas • Equipment Marking and Labeling Requirements • Temperature Class, Voltage Ratings, and Protection Class Considerations • Certification Types for Specific Equipment
1230 - 1245	Break
1245 - 1330	Preventive Maintenance of Electrical & Instrumentation Equipment Importance of Preventive Maintenance in Hazardous Areas • Maintenance Checks for Explosion-Proof and Intrinsically Safe Equipment • Inspection Criteria and Intervals for Equipment • Documentation and Record-Keeping
1330 - 1420	Case Studies on Instrumentation Failures Common Failures in Instrumentation and Electrical Equipment • Real-Life Examples of Equipment Failures in Hazardous Atmospheres • Lessons Learned and Corrective Actions • Strategies to Prevent Recurrence
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

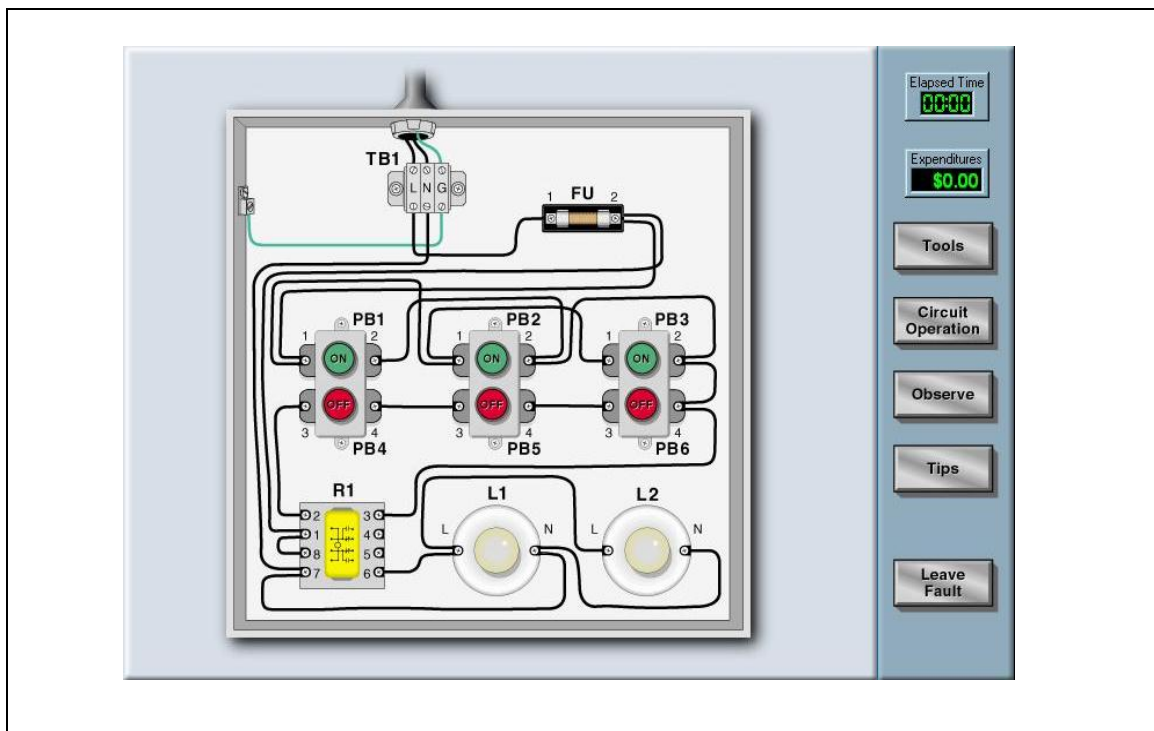
Day 3

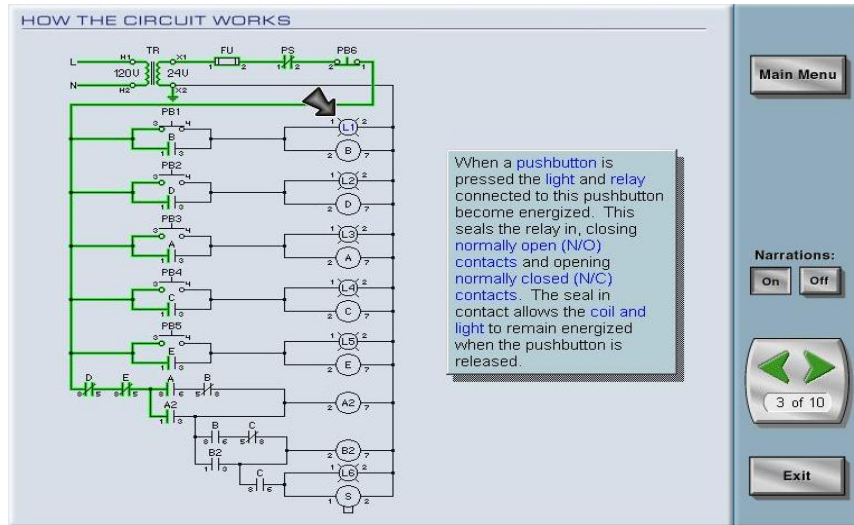
0730 – 0830	Best Practices for Electrical & Instrumentation Installations Installation Guidelines for Hazardous Locations • Use of Proper Seals, Enclosures, and Cable Glands • Design Considerations for Minimizing Risks • Verification and Compliance with Installation Standards
0830 – 0930	Troubleshooting Electrical & Instrumentation Equipment in Hazardous Zones Troubleshooting Techniques for Electrical Systems • Diagnostic Tools and Equipment for Hazardous Environments • Common Troubleshooting Issues in Hazardous Zones • Safety Procedures while Troubleshooting
0930 - 0945	Break
0945 – 1030	Advanced Explosion Protection Methods Pressurized Enclosures (Purging and Pressurization) • Increased Safety and Dust Protection Techniques • Fluidized Bed Protection Systems • Hybrid Protection Schemes for Complex Installations

1030 - 1130	Innovations in Hazardous Location Equipment <i>Emerging Technologies for Explosion Protection • Remote Monitoring and Diagnostic Systems • Wireless Instrumentation and Its Challenges in Hazardous Areas • Advances in Battery-Operated Instrumentation</i>
1130 - 1230	Training & Competency for Working in Hazardous Atmospheres <i>Training Requirements for Electrical and Instrumentation Personnel • Competency-Based Certification Programs (NEC, IECEx, ATEX) • On-the-Job Safety Drills and Simulations • The Role of Ongoing Professional Development</i>
1230 - 1245	Break
1245 - 1345	Future Trends & Regulations in Hazardous Atmosphere Equipment <i>Upcoming Changes in Hazardous Area Classification Standards • The Role of IoT and AI in Hazardous Zone Safety • Global Trends in Explosion-Proof and Intrinsically Safe Technologies • Regulatory Changes and Their Impact on Equipment Selection</i>
1345 - 1400	Course Conclusion <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
1400 - 1415	POST TEST
1415 - 1430	Presentation of Course Certificates
1430	Lunch & End of Course

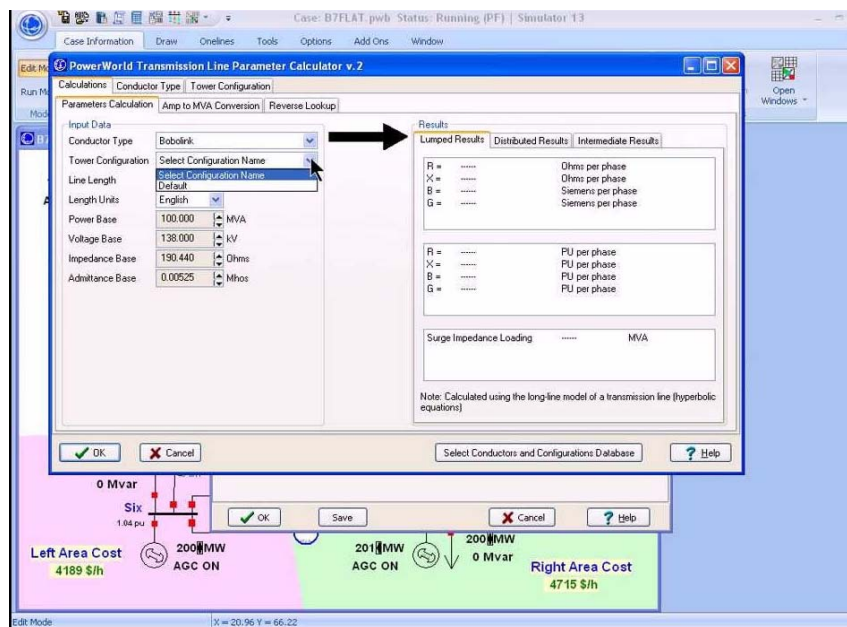
Simulator (Hands-on Practical Sessions)

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 simulator “Simutech Troubleshooting Electrical Circuits V4.1”, Power World” and “ETAP software”.

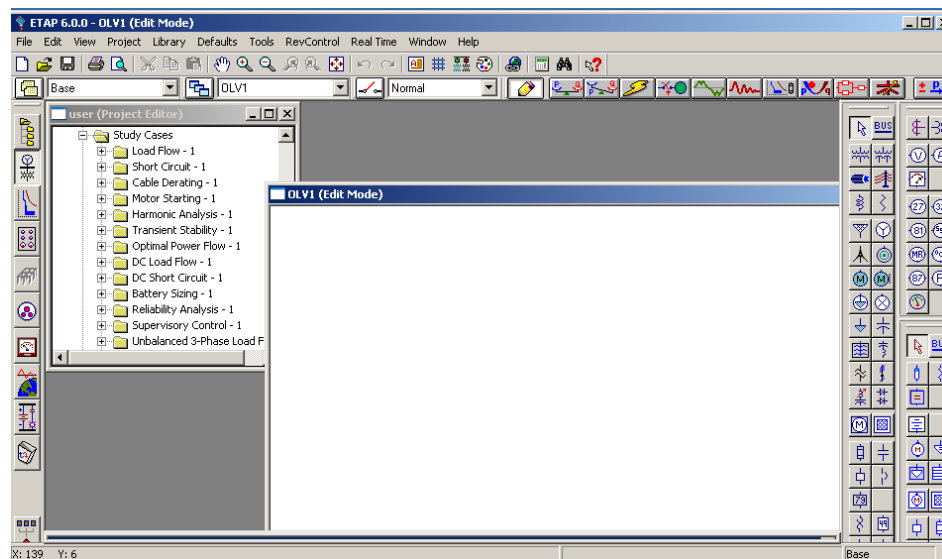




Simutech Troubleshooting Electrical Circuits V4.1



Power World Simulator



ETAP Software Simulator

Course Coordinator

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