

**COURSE OVERVIEW EE0709**  
**Electrical Fault Finding Procedure**

**Course Title**

Electrical Fault Finding Procedure

**Course Date/Venue**

December 07-11, 2025/Boardroom 1, Elite Byblos Hotel, Al Barsha, Sheikh Zayed Road, Dubai, UAE

**Course Reference**

EE0709

**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 Fault Finding Procedure. It covers the components and operations of electrical systems and the importance of fault finding in maintaining system reliability; the basic electrical concepts of voltage, current, resistance and power as well as AC and DC systems; the types of electrical faults, proper personal protective equipment (PPE) and safe working practices and lockout/tagout procedures; reading and interpreting electrical diagrams; and the circuit symbols and layouts and fault-finding tools.



Further, the course will also discuss the fault-finding step-by-step approach, visual inspections and common fault indicators and basic electrical tests; the use of multimeters for fault diagnosis; the insulation resistance tests and identifying and locating earth faults; the circuit breaker and protection device testing, keeping accurate records of tests and results and proper documentation; the use of clamp meters and oscilloscopes; identifying and diagnosing complex faults; testing motors and drives; and the transformer testing and fault diagnosis.

During this interactive course, participants will learn to test and troubleshoot control circuits, apply fault finding in power distribution systems, diagnose faults in switchgear and busbars and test and maintain power distribution panels; develop a preventive maintenance plan and create effective maintenance schedules; carryout predictive maintenance techniques, energy efficiency and system optimization; the emerging technologies in fault finding; and ensuring the compliance in fault finding procedures.

### **Course Objectives**

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

- Apply and gain a comprehensive knowledge on electrical fault finding procedure
- Discuss the components and operations of electrical systems and the importance of fault finding in maintaining system reliability
- Describe the basic electrical concepts of voltage, current, resistance and power as well as AC and DC systems
- Identify the types of electrical faults, use proper personal protective equipment (PPE) and apply safe working practices and lockout/tagout procedures
- Read and interpret electrical diagrams as well as identify circuit symbols and layouts and fault-finding tools
- Illustrate fault finding step-by-step approach, visual inspections and common fault indicators and basic electrical tests
- Use multimeters for fault diagnosis, conduct insulation resistance tests and identify and locate earth faults
- Apply circuit breaker and protection device testing, keeping accurate records of tests and results and proper documentation
- Use clamp meters and oscilloscopes, identify and diagnose complex faults, test motors and drives and apply transformer testing and fault diagnosis
- Test and troubleshoot control circuits, apply fault finding in power distribution systems, diagnose faults in switchgear and busbars and test and maintain power distribution panels
- Develop a preventive maintenance plan and create effective maintenance schedules
- Carryout predictive maintenance techniques, energy efficiency and system optimization
- Discuss the emerging technologies in fault finding and ensure compliance in fault finding procedures

### **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 fault finding procedure for electrical technicians and engineers, maintenance staff, facilities managers, safety officers, industrial electricians, apprentices and trainees, HVAC technicians, building inspectors.

**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: -


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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.

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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.



### 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 **45 years** of extensive experience in **Oil, Gas, Petrochemical, Refinery & Power** industries. His expertise includes **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.

### 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.

### 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: Sunday, 07<sup>th</sup> of December 2025**

0730 – 0800	<i>Registration &amp; Coffee</i>
0800 – 0815	<i>Welcome &amp; Introduction</i>
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Overview of Electrical Systems in District Cooling</b> <i>Components and Operations of Electrical Systems • Importance of Fault Finding in Maintaining System Reliability</i>
0930 – 0945	<i>Break</i>
0945 – 1045	<b>Basic Electrical Concepts</b> <i>Voltage, Current, Resistance, and Power • AC and DC Systems</i>
1045 – 1130	<b>Types of Electrical Faults</b> <i>Short Circuits, Open Circuits, Ground Faults, and Overloads • Symptoms and Effects of Different Faults</i>
1130 – 1230	<b>Safety Procedures &amp; Precautions</b> <i>Personal Protective Equipment (PPE) • Safe Working Practices and Lockout/Tagout Procedures</i>
1230 – 1245	<i>Break</i>
1245 – 1330	<b>Using Electrical Diagrams &amp; Schematics</b> <i>Reading and Interpreting Electrical Diagrams • Understanding Circuit Symbols and Layouts</i>
1330 – 1420	<b>Fault Finding Tools</b> <i>Multimeters, Clamp Meters, Insulation Testers, and Oscilloscopes • Proper Use and Calibration of Tools</i>
1420 – 1430	<b>Recap</b> <i>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</i>
1430	<i>Lunch &amp; End of Day One</i>



**Day 2: Monday, 08<sup>th</sup> of December 2025**

0730 – 0830	<b>Fault Finding Methodologies</b> <i>Step-by-Step Approach to Fault Finding • Top-Down Versus Bottom-Up Approaches</i>
0830 – 0930	<b>Initial Inspection &amp; Testing</b> <i>Visual Inspections and Common Fault Indicators • Performing Basic Electrical Tests</i>
0930 – 0945	Break
0945 – 1100	<b>Using Multimeters for Fault Diagnosis</b> <i>Measuring Voltage, Current, and Resistance • Identifying Faults Using Multimeter Readings</i>
1100 – 1230	<b>Insulation Testing &amp; Earth Faults</b> <i>Conducting Insulation Resistance Tests • Identifying and Locating Earth Faults</i>
1230 – 1245	Break
1245 – 1330	<b>Circuit Breaker &amp; Protection Device Testing</b> <i>Testing Circuit Breakers and Fuses • Ensuring Proper Functioning of Protective Devices</i>
1330 – 1420	<b>Recording &amp; Documenting Findings</b> <i>Keeping Accurate Records of Tests and Results • Importance of Documentation for Future Reference</i>
1420 – 1430	<b>Recap</b> <i>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</i>
1430	Lunch & End of Day Two

**Day 3: Tuesday, 09<sup>th</sup> of December 2025**

0730 – 0830	<b>Using Clamp Meters &amp; Oscilloscopes</b> <i>Measuring Current with Clamp Meters • Analyzing Waveforms with Oscilloscopes</i>
0830 – 0930	<b>Identifying &amp; Diagnosing Complex Faults</b> <i>Handling Intermittent Faults • Dealing with Multiple Faults in a System</i>
0930 - 0945	Break
0945 – 1100	<b>Testing Motors &amp; Drives</b> <i>Fault Finding in Electric Motors • Diagnosing Issues in Variable Frequency Drives (VFDs)</i>
1100 – 1230	<b>Transformer Testing &amp; Fault Diagnosis</b> <i>Testing Transformer Windings and Insulation • Identifying Common Transformer Faults</i>
1230 – 1245	Break
1245 - 1330	<b>Testing &amp; Troubleshooting Control Circuits</b> <i>Diagnosing Faults in Control Panels • Testing Relays, Contactors, and Timers</i>
1330 – 1420	<b>Fault Finding in Power Distribution Systems</b> <i>Diagnosing Faults in Switchgear and Busbars • Testing and Maintaining Power Distribution Panels</i>
1420 – 1430	<b>Recap</b> <i>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</i>
1430	Lunch & End of Day Three





**Day 4: Wednesday, 10<sup>th</sup> of December 2025**

0730 – 0830	<b>Fault Finding Workshop</b> <i>Practical Exercises in Fault Finding • Applying Techniques Learned</i>
0830 – 0930	<b>Simulating Electrical Faults</b> <i>Creating Fault Scenarios for Practice • Diagnosing and Correcting Simulated Faults</i>
0930 - 0945	<i>Break</i>
0945 – 1100	<b>Real-World Case Studies</b> <i>Analyzing Case Studies of Actual Faults • Lessons Learned and Best Practices</i>
1100 – 1230	<b>Using Diagnostic Software &amp; Tools</b> <i>Introduction to Electrical Diagnostic Software • Training with Diagnostic Tools</i>
1230 – 1245	<i>Break</i>
1245 - 1420	<b>Collaborative Fault Finding</b> <i>Group Activities and Problem Solving • Sharing Techniques and Approaches</i>
1330 – 1420	<b>Review &amp; Feedback</b> <i>Reviewing Fault Finding Exercises • Providing and Receiving Feedback</i>
1420 – 1430	<b>Recap</b> <i>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</i>
1430	<i>Lunch &amp; End of Day Four</i>

**Day 5: Thursday, 11<sup>th</sup> of December 2025**

0730 – 0830	<b>Developing a Preventive Maintenance Plan</b> <i>Importance of Preventive Maintenance • Creating Effective Maintenance Schedules</i>
0830 – 0930	<b>Predictive Maintenance Techniques</b> <i>Using Data for Predictive Maintenance • Implementing Predictive Maintenance Programs</i>
0930 - 0945	<i>Break</i>
0945 – 1100	<b>Energy Efficiency &amp; System Optimization</b> <i>Role of Fault Finding in Improving Efficiency • Techniques for System Optimization</i>
1100 – 1230	<b>Emerging Technologies in Fault Finding</b> <i>Introduction to Advanced Fault Finding Technologies • Future Trends in Electrical Diagnostics</i>
1230 – 1245	<i>Break</i>
1230 - 1345	<b>Regulatory Compliance &amp; Standards</b> <i>Understanding Relevant Standards and Regulations • Ensuring Compliance in Fault Finding Procedures</i>
1345 - 1400	<b>Course Conclusion</b> <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
1400 - 1415	<b>POST-TEST</b>
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch &amp; End of Course</i>

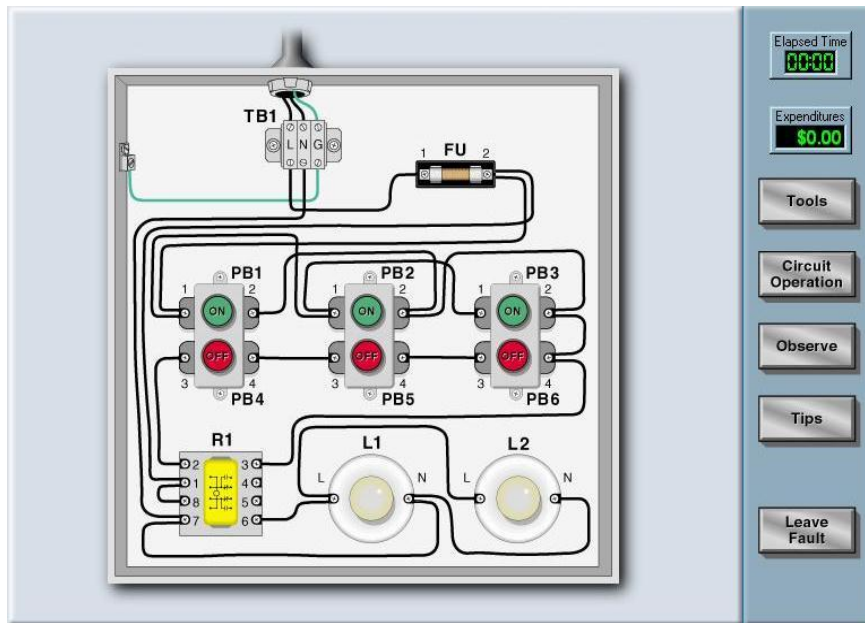




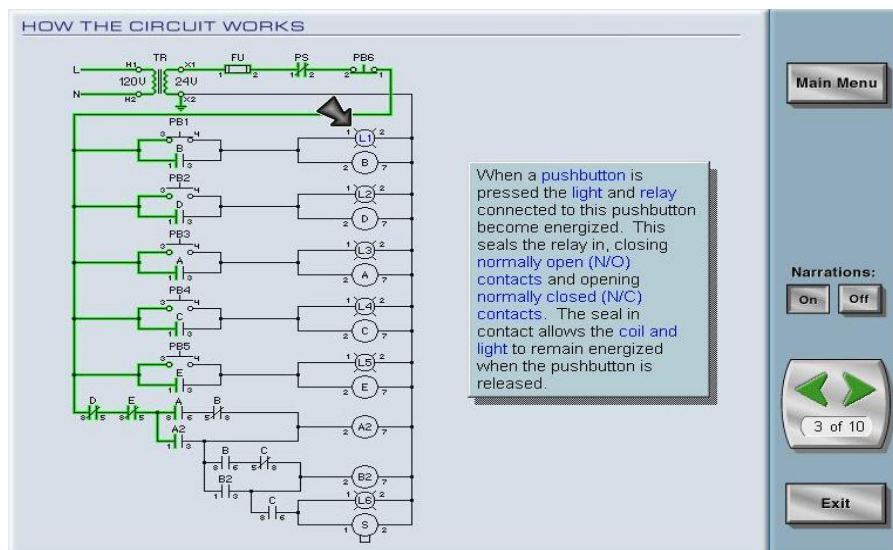


### Simulator (Hands-on Practical Sessions)

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 “Haward Troubleshooting” simulator.



### Basic Techniques



### Basic Control Circuits





**Guided Troubleshooting**

Does the door operate properly?

Yes No

Observations

Minimize

Tools Observe Tips Elapsed Time 00:00 Expenditures \$0.00 Leave Fault

**Motor Control Techniques**

**Course Coordinator**

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