COURSE OVERVIEW EE1170
Interpreting and Following Electrical Engineering Documentation

Course Title
Interpreting and Following Electrical Engineering Documentation

Course Date/Venue
September 21-25, 2025/The Mouna Meeting Room, The H Hotel, Sheikh Zayed Road Trade Centre, Dubai, UAE

Course Reference
EE1170

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Interpreting and Following Electrical Engineering Documentation. It covers the electrical engineering documentation, types of electrical drawings and industry standards and symbols; the document control and revision management and basic reading skills for drawings; avoiding mistaking symbol meaning and ignoring revision updates; misreading scale or dimensions and overlooking hidden notes; the single-line diagram (SLD) fundamentals, interpreting power distribution SLDs and control schematics; and the motor control center (MCC) diagrams and panel wiring diagrams.

Further, the course will also discuss the circuit from source to load and breaker ratings and settings; matching symbols to components in the field and cross-checking SLD with wiring diagrams; the general arrangement (GA) drawings, lighting layouts, cable routing and tray layouts and earthing and lightning protection layouts; the manufacturer's documentation, field verification techniques and process and instrumentation diagrams (P&IDs); and the SCADA and control system drawings, protection and relay coordination diagrams and testing and commissioning documentation.

During this interactive course, participants will learn the specifications and BOQs, troubleshooting using documentation and compliance and audit requirements; the mechanical coordination, civil/structural considerations, instrumentation integration and communication systems documentation; the electrical safety rules and MCC emergency bus and normal bus bar equipment; and the best practices and continuous improvement by maintaining accuracy and clarity, regular updates and as-built documentation and effective communication with stakeholders.

Course Objectives

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

- Apply and gain an in-depth knowledge on interpreting and following electrical engineering documentation
- Discuss electrical engineering documentation, types of electrical drawings and industry standards and symbols
- Carryout document control and revision management and basic reading skills for drawings
- Avoid mistaking symbol meaning, ignoring revision updates, misreading scale or dimensions and overlooking hidden notes
- Illustrate single-line diagram (SLD) fundamentals, interpreting power distribution SLDs, control schematics, motor control center (MCC) diagrams and panel wiring diagrams
- Follow a circuit from source to load, identify breaker ratings and settings, match symbols to components in the field and cross-check SLD with wiring diagrams
- Describe general arrangement (GA) drawings, lighting layouts, cable routing and tray layouts and earthing and lightning protection layouts
- Apply manufacturer's documentation, field verification techniques and process and instrumentation diagrams (P&IDs)
- Illustrate SCADA and control system drawings, protection and relay coordination diagrams and testing and commissioning documentation
- Interpret specifications and BOQs, troubleshoot using documentation and recognize compliance and audit requirements
- Discuss mechanical coordination, civil/structural considerations, instrumentation integration and communication systems documentation
- Identify electrical safety rules and MCC emergency bus and normal bus bar equipment
- Apply best practices and continuous improvement by maintaining accuracy and clarity, regular updates and as-built documentation and effective communication with stakeholders

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 interpreting and following electrical engineering documentation for electrical engineers, project managers, inspectors, contractors, supervisors, foremen, draftsmen 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.

Accommodation

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

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 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. Pan Marave, PE, MSc, BEng, is a **Senior Electrical & Instrumentation Engineer** with over **30 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 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, 21st of September 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Electrical Engineering Documentation*** *Purpose & Importance in Project Execution • Types of Documentation (Design, Construction, Operation) • Role in Safety & Compliance • Integration with Other Engineering Disciplines*
0930 – 0945	*Break*

0945 – 1030	***Types of Electrical Drawings*** *Single-Line Diagrams (SLDs) • Wiring Diagrams • Layout Drawings • Control Schematics*
1030 – 1130	***Industry Standards & Symbols*** *IEC & IEEE Electrical Symbol Conventions • ANSI/ISA Standards for Control Diagrams • Common Legends & Abbreviations • Interpreting Title Blocks & Revision Notes*
1130 – 1215	***Document Control & Revision Management*** *Revision Numbering Systems • Document Approval Workflows • Version History Tracking • Importance of Change Logs*
1215 – 1230	*Break*
1230 – 1330	***Basic Reading Skills for Drawings*** *Understanding Line Types & Weights • Identifying Components & Connections • Tracing Circuits in Diagrams • Cross-Referencing Between Drawings*
1330 – 1420	***Common Errors & Misinterpretations*** *Mistaking Symbol Meaning • Ignoring Revision Updates • Misreading Scale or Dimensions • Overlooking Hidden Notes*
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: ***Monday, 22nd of September 2025***

0730 – 0830	***Single-Line Diagram (SLD) Fundamentals*** *Purpose & Scope • Main Elements (Sources, Loads, Breakers) • Voltage Levels & Busbars • Protective Devices*
0830 – 0930	***Interpreting Power Distribution SLDs*** *Incoming Supply Arrangement • Transformer Connections • Switchgear Layout Representation • Load Feeders & Sub-Panels*
0930 – 0945	*Break*
0945 – 1100	***Control Schematics*** *Symbols for Relays, Switches, Sensors • Control Power Sources • Sequential Control Representation • Interlock Logic Diagrams*
1100 – 1215	***Motor Control Center (MCC) Diagrams*** *Direct-On-Line (DOL) Starter Diagrams • Star-Delta Starter Schematics • Variable Frequency Drive (VFD) Integration • Control & Protection Circuits*
1215 – 1230	*Break*
1230 – 1330	***Panel Wiring Diagrams*** *Terminal Numbering Conventions • Wire Color Coding Standards • Cable Routing Representation • Equipment Mounting Layout*
1330 – 1420	***Practical Reading Exercises*** *Following a Circuit from Source to Load • Identifying Breaker Ratings & Settings • Matching Symbols to Components in the Field • Cross-Checking SLD with Wiring Diagrams*
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:	Tuesday, 23rd of September 2025
0730 – 0830	***General Arrangement (GA) Drawings*** *Purpose in Construction & Installation • Scale Interpretation • Identifying Equipment Footprints • Clearances & Access Requirements*
0830 – 0930	***Lighting Layouts*** *Fixture Symbols & Locations • Circuiting & Switching Arrangements • Illumination Level Requirements • Emergency Lighting Integration*
0930 – 0945	*Break*
0945 – 1100	***Cable Routing & Tray Layouts*** *Cable Tray Symbols & Conventions • Segregation of Power & Control Cables • Riser Diagrams & Cable Ladder Routes • Space Coordination with Other Services*
1100 – 1215	***Earthing & Lightning Protection Layouts*** *Earthing Symbols & Connections • Grounding Electrode Arrangements • Lightning Protection Points • Bonding of Metallic Parts*
1215 – 1230	*Break*
1230 – 1330	***Manufacturer's Documentation*** *Datasheets & Specification Sheets • Installation Manuals • Operation & Maintenance Instructions • Nameplate Data Interpretation*
1330 – 1420	***Field Verification Techniques*** *Marking Up As-Built Drawings • Verifying Equipment Tags & IDs • Recording Deviations • Updating Red-Line Drawings*
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:	Wednesday, 24th of September 2025
0730 – 0830	***Process & Instrumentation Diagrams (P&IDs)*** *Electrical Relevance in P&IDs • Signal Lines & Control Loops • Instrument Identification • Power Supply Indications*
0830 – 0930	***SCADA & Control System Drawings*** *Network Architecture Diagrams • I/O Point Mapping • PLC Wiring Schematics • Control Cabinet Layouts*
0930 – 0945	*Break*
0945 – 1100	***Protection & Relay Coordination Diagrams*** *Relay Settings Documentation • Protection Zone Drawings • Trip Logic Schematics • Coordination Studies*
1100 – 1215	***Testing & Commissioning Documentation*** *Test Procedure Sheets • Commissioning Checklists • FAT & SAT Reports • Compliance Certificates*
1215 – 1230	*Break*
1230 – 1330	***Interpreting Specifications & BOQs*** *Technical Specification Breakdown • Material & Equipment Lists • Quantity Verification • Compliance with Contract Documents*

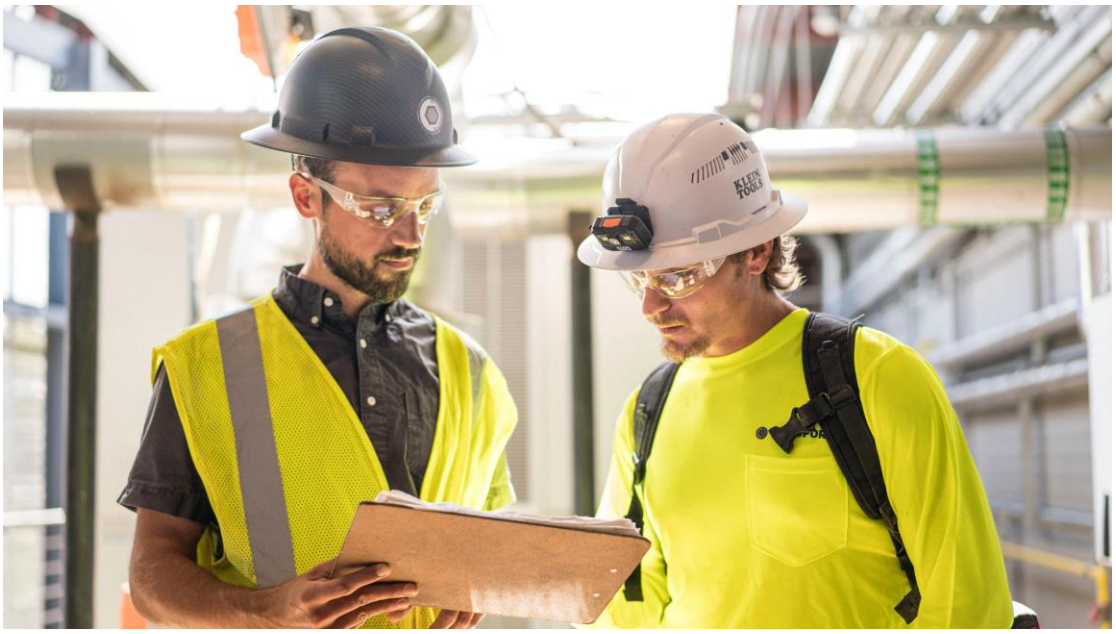
1330 – 1420	***Troubleshooting Using Documentation*** *Locating Faults Using Diagrams • Cross-Referencing with Test Results • Identifying Potential Design Errors • Linking Symptoms to Probable Causes*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5: ***Thursday, 25th of September 2025***

0730 – 0830	***Case Studies of Electrical Documentation in Projects*** *Power Plant Example • Industrial Facility Example • Building Services Example • Offshore Platform Example*
0830 – 0930	***Hands-On Documentation Exercises*** *Reading & Tracing Complex SLDs • Extracting Cable Schedules • Interpreting Protection Settings • Completing a Red-Line Markup*
0930 – 0945	*Break*
0945 – 1100	***Compliance & Audit Requirements*** *ISO 9001 Document Control Clauses • Electrical Safety Audits • Regulatory Compliance Checks • Third-Party Verification*
1100 – 1130	*Mechanical Coordination • Civil/Structural Considerations • Instrumentation Integration • Communication Systems Documentation*
1130 – 1215	***Electrical Safety Rules***
1215 – 1230	*Break*
1230 – 1315	***MCC Emergency Bus Bar Equipment & Normal Bus Bar Equipment***
1315 – 1345	***Best Practices & Continuous Improvement*** *Maintaining Accuracy & Clarity • Regular Updates & As-Built Documentation • Effective Communication with Stakeholders • Lessons Learned Documentation*
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

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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