



COURSE OVERVIEW EE0430 Quality and Security of Electrical Supply

Course Title

Quality and Security of Electrical Supply

Course Date/Venue

Session 1: May 25-29, 2025/Boardroom 1,
Elite Byblos Hotel Al Barsha,
Sheikh Zayed Road, Dubai, UAE
Session 2: November 03-07, 2025/Fujairah
Meeting Room, Grand Millennium
Al Wahda Hotel, Abu Dhabi, UAE



Course Reference

EE0430

Course Duration

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.



The rapidly increasing installation of electronic equipment such as digital controls, computers and sensitive process control equipment has increased the susceptibility of utility customers to supply disturbances. In addition, the application of power electronic equipment with its higher energy efficiency and more effective control features has in turn often increased the level of disturbances that might affect customer equipment. Utilities are committed to be more customer-focused and to be able to give advice to customers who may have power quality concerns. The Quality of Electrical Supply course will give a practical understanding of the principles, practices and problems associated with supply quality. This course will cover all power quality problems including voltage sags, harmonics, transients and light flicker. Delegates will learn analysis fundamentals, instrumentation techniques and methods of improving power quality by both network and plant modifications. A feature of the course will be a number of hands-on computer investigations for “what-if” scenarios Course participants will have the opportunity to develop their knowledge and skills through discussion and group work sessions.



Course Objectives

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

- A systematic understanding of the various power quality problems, including the causes of power disturbances and the types of load affected
- The estimation of the orders of magnitude of problem situations through computer simulation
- Knowledge of the standards for particular types of disturbances and actions if standard limits are exceeded
- Distinguishing the different types of available power quality monitoring equipment and their particular applications
- Knowledge of how utilities and customers can improve their power quality

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

Managers, utility specialists and senior technical staff who wish to advise customers on power quality concerns, or who service large customers or who wish to understand aspects of network design, construction and maintenance techniques for maximising quality of supply. Personnel working in all areas of power system design who wish to know how the system interacts with the end-user will also gain from this course.

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 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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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.

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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.

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. Ahmed Abozeid is a **Senior Electrical Engineer** with over **30 years** of **Onshore & Offshore** experience within the **Oil & Gas** and **Power** industries. His wide expertise covers **Electrical Motors & Variable Speed Drives**, **Motor Speed Control**, **Power Electronic Converters**, **AC Converters Section**, **Electromagnetic Compatibility (EMC)**, **Motor Failure Analysis & Testing**, **Machinery Fault Diagnosis**, **Bearing Failure Analysis** **Process Control & Instrumentation**, **Process Control Measurements**, **Control System Commissioning & Start-Up**, **Control System & Monitoring**, **Power Station Control System**, **Instrumentation Devices**, **Process Control & Automation**, **PID Controller**, **Distributed Control Systems (DCS)**, **Programmable Logic Controllers (PLC)**, **ABB PLC & DCS System**, **Gas Analyzers**, **Simulation Testing**, **Load Flow**, **Short Circuit**, **Smart Grid**, **Vibration Sensors**, **Cable Installation & Commissioning**, **Calibration Commissioning** and **Site Filter Controller**. Further, he is also well-versed in **Fundamentals of Electricity**, **Electrical Standards**, **Electrical Power**, **PLC**, **Electrical Wiring**, **Machines**, **Transformers**, **Motors**, **Power Stations**, **Electro-Mechanical Systems**, **Automation & Control Systems**, **Voltage Distribution**, **Power Distribution**, **Filters**, **Automation System**, **Electrical Variable Speed Drives**, **Power Systems**, **Power Generation**, **Power Transformers**, **Diesel Generators**, **Power Stations**, **Uninterruptible Power Systems (UPS)**, **Battery Chargers** and **AC & DC Transmission**. He is currently the **Project Manager** wherein he manages, plans and implements projects across different lines of business.

Mr. Ahmed worked as the **Electrical Manager**, **Electrical Power & Machine Expert**, **Electrical Process Leader**, **Team Leader**, **Electrical Team Leader**, **Technical Instructor**, and **Instructor/Trainer** from various companies such as the Lafarge Nigeria, Egyptian Cement Company, ECC Training Center, Alrajhi Construction & Building Company and Ameria Cement Company, just to name a few.

Mr. Ahmed has a **Bachelor’s** degree in **Electrical Engineering**. Further, he is a **Certified Instructor/Trainer**, **Certified TQUK Level 3 Vocational Achievement (RQF) Assessor** and has delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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 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	<i>Registration & Coffee</i>
0800 - 0815	<i>Welcome & Introduction</i>
0815 - 0915	Introduction: <i>Overview of Power Quality Issues and their Increasing Significance, Definitions, Problems and Causes</i>
0915 - 1015	Modelling and Analysis: <i>Review of Power System Analytical Techniques Including Harmonic Calculations</i>
1015 - 1030	<i>Break</i>
1030 - 1230	Load Behaviour: <i>Typical Nonlinear Loads (e.g. VSDs, Rectifiers, AC Phase Control, Computers, etc.), How they Affect Power Quality and how they are Affected by Power Quality Problems</i>
1230 - 1245	<i>Break</i>
1245 - 1345	Voltage Fluctuations: <i>Causes • Effects on Loads • Measurement and Limits • Mitigation</i>
1345 - 1420	Transient Over Voltages: <i>Types • Causes • Effects on Loads • Mitigation • Analysis Methods</i>
1420 - 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 - 0930	Harmonics: <i>Relationship Between Voltage and Current Distortion • Sequence Properties of Harmonics • Causes of Harmonic Production • Harmonic Calculation Methods • Effects on Electrical Equipment • Mitigation</i>
0930 - 0945	<i>Break</i>
0945 - 1145	Standards: <i>Philosophy Behind Standards • Voltage Fluctuation and Harmonic Standards from Australia • IEC & IEEE, State Codes & Regulations</i>
1145 - 1200	<i>Break</i>
1200 - 1420	Long Duration Voltage Variation: <i>Effects on Connected Equipment, Voltage Regulation and its Improvement by Capacitors, SVCs, etc, Causes of Voltage Unbalance and Its Effects</i>
1420 - 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

0730 - 0930	Voltage Sags and Interruptions: <i>Causes, Effects, Fault & Motor Starting Considerations, Customer & Network Solutions</i>
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0930 - 0945	Break
0945 - 1145	Monitoring: Power Quality Instrumentation, Surveying Practices, Data Evaluation and Power Quality Indices
1145 - 1200	Break
1200 - 1420	Group work: Small Group Activities Looking at Different Aspects of Power Quality
1420 - 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 - 0930	Power Quality Demonstrations: Current and Voltage Waveforms Associated with Power Quality Disturbances; Instrumentation; Equipment Response
0930 - 0945	Break
0945 - 1145	Case Study No.1: Practical Wiring and Earthing Problems and their Solutions
1145 - 1200	Break
1200 - 1420	Case Study No.2: Practical Harmonic Problems and Their Solutions
1420 - 1430	Recap
1400 - 1430	Lunch & End of Day Four

Day 5

0730 - 0930	Case Study No.3: Practical Voltage Sag Problems and their Solutions
0930 - 0945	Break
0945 - 1145	Group Work: Small Group Activities Looking at Different Aspects of Power Quality
1145 - 1200	Break
1200 - 1345	Final Session: Groups Present a Summary of their Investigations
1345 - 1400	Course Conclusion
1400 - 1415	POST-TEST
1415 - 1430	Presentation of Course Certificates
1430	End of Course

Practical Sessions

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



Course Coordinator

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