

## COURSE OVERVIEW EE0464 HV Transformer Construction Certification

### Course Title

HV Transformer Construction Certification

### Course Date/Venue

October 06-10, 2024/Boardroom 1, Elite  
Byblos Hotel Al Barsha, Sheikh Zayed Road,  
Dubai, UAE

### Course Reference

EE0464

### Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

### Course Description

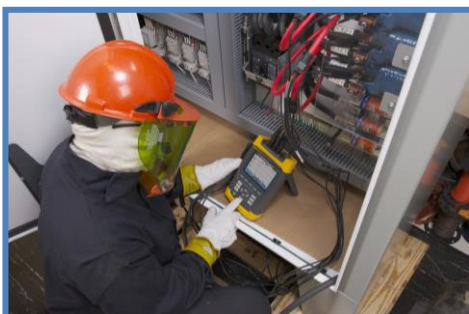


***This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.***

This course is designed to provide participants with a detailed and an up-to-date overview of HV Transformer Construction. It covers the basic principles, types and applications of transformers and identify the specific characteristics, uses and challenges of hv transformers; the materials, design and construction of transformer cores and differences and applications of core types as well as discuss the safety practices during transformer core construction; the different materials and types of windings in HV transformers and illustrate detailed walkthrough of the process of winding construction; and the materials used for insulation in hv transformers.



Further, the course will also discuss the insulation construction: process and importance of insulation construction; the cooling and ventilation system construction including the role, design and construction of cooling and ventilation systems in HV transformers; the tank construction materials, design and construction of HV transformer tanks and bushing types and materials, understanding the types and materials used for transformer bushings; the bushing construction as well as detailed walkthrough of the bushing construction process.





During this interactive course, participants will learn the techniques for testing the integrity of tanks and bushings and install of cooling and ventilation systems and detailed explanation of the installation process; the proper step-by-step guide to assembling HV transformers and discuss of safety protocols during assembly; the process and precautions while filling; the electrical tests after the assembly and discuss quality standards and assurance methods in transformer construction; the preventive maintenance practices for HV transformers and perform dissolved gas analysis (DGA) for HV transformers; the concluding remarks, discussing the path forward and collecting participant feedback.

### **Course Objectives**

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

- Apply and gain a comprehensive knowledge on HV transformer construction
- Explain the basic principles, types and applications of transformers and identify the specific characteristics, uses and challenges of hv transformers
- Evaluate the materials, design and construction of transformer cores and differences and applications of core types as well as discuss the safety practices during transformer core construction and
- Recognize the different materials and types of windings in HV transformers and illustrate detailed walkthrough of the process of winding construction
- Identify the materials used for insulation in HV transformers
- Carryout insulation construction: process and importance of insulation construction
- Discuss cooling and ventilation system construction including the role, design and construction of cooling and ventilation systems in HV transformers
- Explain tank construction materials, design and construction of HV transformer tanks and bushing types and materials, understanding the types and materials used for transformer bushings
- Determine bushing construction as well as detailed walkthrough of the bushing construction process
- Identify the techniques for testing the integrity of tanks and bushings and install of cooling and ventilation systems and detailed explanation of the installation process
- Use the proper step-by-step guide to assembling HV transformers and discuss of safety protocols during assembly
- Recognize process and precautions while filling transformer oil and techniques for testing and rectifying oil leaks
- Perform electrical tests after the assembly and discuss quality standards and assurance methods in transformer construction
- Identify the techniques to diagnose and rectify common problems in hv transformers
- Carryout preventive maintenance practices for HV transformers and perform dissolved gas analysis (DGA) for HV transformers
- Explain concluding remarks, discussing the path forward and collecting participant feedback



### **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, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

### **Who Should Attend**

This course provides an overview of all significant aspects and considerations of HV transformer construction for those who are involved in splicing, jointing, termination and testing of power cables. This includes electrical engineers, instrumentation and control engineers, project engineers, maintenance engineers, power system protection and control engineers, building service designers, data systems planners and managers as well as electrical, instrumentation and control 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.

### **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 Certificate(s)**

(1) Internationally recognized Wall Competency Certificates and Plastic Wallet Card Certificates will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

**Recertification is FOC for a Lifetime.**

**Sample of Certificates**

The following are samples of the certificates that will be awarded to course participants:-





- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

\* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \*

## Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

### CEU Official Transcript of Records

CEUs

**TOR Issuance Date:** 14-Nov-23  
**HTME No.** 74851  
**Participant Name:** Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
EE0464	HV Transformer Construction Certification	November 10-14, 2023	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

**TRUE COPY**  
  
**Jaryl Castillo**  
 Academic Director

Haward Technology has been approved as an Accredited Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2018 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2018 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 Association 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 is accredited by

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**Certificate Accreditations**


Certificates are accredited by the following international accreditation organizations: -

-  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.

-  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:



**Dr. Mike Tay**, PhD, MSc, BSc, is a **Senior Electrical, Instrumentation & Communications Engineer** with over **40 years** of extensive experience. His expertise widely covers in **Cable & Over Head Line, Electrical Drawing, Electrical, Distribution Networks, Electrical Forecasting, Protective Devices Troubleshooting, Protective Devices Testing & Maintenance, Uninterruptible Power Supply (UPS) Design, Industrial UPS Systems & Battery Power Supplies Maintenance & Troubleshooting, UPS & Battery System, Battery & Battery Charger & UPS** and Measurement Devices, **UPS System & Battery Chargers Maintenance & Troubleshooting, UPS & Battery Design, Operation, Maintenance & Troubleshooting, UPS Operation & Alarm Panel Reading, Power Quality Studies and Load Criteria, Load calculation, Circuit Breaker, HV Switchgear Operation & Maintenance, HV/MV Cable Splicing, Jointing, Inspection & Termination, HV/LV Equipment, High Voltage Electrical Safety, LV & HV Electrical System, HV Equipments Inspection & Maintenance, LV Distribution Switchgear & Equipment, Power Generation Operation & Control, HV/MV Switchgear, LV/MV Cable Splicing, Termination & Testing, Power System Generation and Distribution, Power System Protection & Relaying, Modern Power System Protective Relaying, Protection Relay Maintenance, Application & Testing, System Analysis, Power System Faults, Protection Scheme Components, Current & Voltage Transformers, Power System Neutral Grounding, Feeder Overcurrent Protection, Electrical Protection Systems, Bus Protection, Motor Protection, Starting & Control, Transformer Protection, Generator Protection, Capacitor Protection, Numerical Relays, SCADA Security, ESD System Analysis & Control, Electrical & Instrumentation, Installation & Inspection, Custody Measurement, Loss Control for Petroleum Products, Process Control & Instrumentation, Fiber Optics Access Network Planning, Safety Instrumented System (SIS), Safety Integrity Level (SIL), PLC Design, Power System, Power Supply Design Management, Basic Electronics & Transformers, Diesel Generator, Electric Motors, Electrical Fundamentals, Basic Electricity & Electrical Codes. Further, he is also well-versed in **Communications, Telecommunications, Mobile Protocols, 4G LTE, GSM/UMTS, CMDA2000, WIMAX Technology, HSPA+, Alarm Management System, Computer Architecture, Logic & Microprocessor Design, Embedded Systems Design plus Computer Networking with CISCO, Network Communication, Industrial Digital Communication, Designing Telecommunications Distribution System, Electrical Engineering, WiMAX Broadband Wireless System, TT Intranet & ADSL Network, TT Web & Voicemail, Off-site ATM Network, IT Maintenance, Say2000i, IP Phone, National Address & ID Automation, Electricity Distribution Network, Customs Network & Maintenance, LAN & WAN Network, UYAP Network, Network Routing Protocols, Multicast Protocols, Network Management Protocols, Mobile & Wireless Networks and Digital Signal Processing. Currently, he is the Technical Advisor of Izmir Altek.****

During his career life, Dr. Tay worked with various companies such as the **KOC Sistem, Meteksan Sistem, Altek BT, Yasar University, Dokuz Eylul University, METU** and occupied significant positions like the **Aegean Region Manager, Group Leader, Technical Services Manager, Field Engineer, Research Assistant, Instructor, Technical Advisor** and the **Dr. Instructor**.

Dr. Tay has **PhD, Master's and Bachelor's** degree in **Electrical & Electronic Engineering** from the **Dokuz Eylul University** and the **Middle East Technical University (METU)** respectively. Further, he is a **Certified Instructor/Trainer, Technical Trainer (Australia), Trainer for Data-Communication System (England & Canada), a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)**, a **Certified CISCO (CCSP, CCDA, CCNP, CCNA, CCNP) Specialist, a Certified CISCO IP Telephony Design Specialist, CISCO Rich Media Communications Specialist, CISCO Security Solutions & Design Specialist** and **Information Systems Security (INFOSEC) Professional**. He has delivered and presented innumerable training courses 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, 06<sup>th</sup> of October 2024**

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Fundamentals of Transformers: Basic Principles, Types &amp; Applications of Transformers</b>
0930 – 0945	Break
0945 – 1100	<b>Basics of High Voltage Transformers: Specific Characteristics, Uses and Challenges of HV Transformers</b>
1100 – 1230	<b>Core Construction: Materials, Design and Construction of Transformer Cores</b>
1230 – 1245	Break
1245 – 1345	<b>Core Types: Differences and Applications of Core Types Such as Shell, Core-Form and Toroidal</b>
1345 – 1420	<b>Safety Considerations in Core Construction: Discussion of Safety Practices During Transformer Core Construction</b>
1420 – 1430	<b>Recap</b>
1430	End of Day One

**Day 2: Monday, 07<sup>th</sup> of October 2024**

0730 – 0930	<b>Winding Materials &amp; Types: Understanding the Different Materials &amp; Types of Windings in HV Transformers</b>
0930 – 0945	Break
0945 – 1100	<b>Winding Construction: Detailed Walkthrough of The Process of Winding Construction</b>
1100 – 1230	<b>Insulating Materials: Overview of Materials Used for Insulation in HV Transformers</b>
1230 – 1245	Break
1245 – 1345	<b>Insulation Construction: Process &amp; Importance of Insulation Construction</b>
1345 – 1420	<b>Cooling &amp; Ventilation System Construction: Role, Design &amp; Construction of Cooling &amp; Ventilation Systems in HV Transformers</b>
1420 – 1430	<b>Recap</b>
1430	End of Day Two

**Day 3: Tuesday, 08<sup>th</sup> of October 2024**

0730 – 0930	<b>Tank Construction: Materials, Design &amp; Construction of HV Transformer Tanks</b>
0930 – 0945	Break
0945 – 1100	<b>Bushing Types &amp; Materials: Understanding the Types &amp; Materials Used for Transformer Bushings</b>
1100 – 1230	<b>Bushing Construction: Detailed Walkthrough of The Bushing Construction Process</b>
1230 – 1245	Break
1245 – 1345	<b>Testing of Tanks &amp; Bushings: Techniques for Testing the Integrity of Tanks and Bushings</b>
1345 – 1420	<b>Installation of Cooling &amp; Ventilation Systems: Detailed Explanation of The Installation Process</b>
1420 – 1430	<b>Recap</b>
1430	End of Day Three







**Day 4: Wednesday, 09<sup>th</sup> of October 2024**

0730 – 0930	<b>Transformer Assembly Process: Step-By-Step Guide to Assembling HV Transformers</b>
0930 – 0945	Break
0945 – 1100	<b>Safety Procedures During Assembly: Discussion of Safety Protocols During Assembly</b>
1100 – 1230	<b>Transformer Oil Filling: Process and Precautions While Filling Transformer Oil</b>
1230 – 1245	Break
1245 – 1345	<b>Leak Testing: Techniques for Testing &amp; Rectifying Oil Leaks</b>
1345 – 1420	<b>Electrical Tests Post Assembly: Performing Electrical Tests After the Assembly</b>
1420 - 1430	<b>Recap</b>
1430	End of Day Four

**Day 5: Thursday, 10<sup>th</sup> of October 2024**

0730 – 0830	<b>Quality Assurance: Understanding Quality Standards &amp; Assurance Methods in Transformer Construction</b>
0830 - 0930	<b>Troubleshooting Common Issues: Techniques to Diagnose &amp; Rectify Common Problems in HV Transformers</b>
0930 – 0945	Break
0945 – 1100	<b>Preventive Maintenance: Overview of Preventive Maintenance Practices for HV Transformers</b>
1100 – 1230	<b>Dissolved Gas Analysis: Understanding &amp; Performing Dissolved Gas Analysis (DGA) for HV Transformers</b>
1230 – 1245	Break
1245 – 1345	<b>Course Wrap-Up &amp; Feedback: Concluding Remarks, Discussing the Path Forward and Collecting Participant Feedback</b>
1345 - 1400	<b>Course Conclusion</b>
1400 - 1415	<b>POST-TEST</b>
1415 – 1430	Presentation of Course Certificates
1430	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”.



**Simutech Troubleshooting Electrical Circuits V4.1**

**Course Coordinator**

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