COURSE OVERVIEW EE0242
Power Transformer Installation and Commissioning

Course Title

Power Transformer Installation and Commissioning

H-STK© INCLUDED

Course Date/Venue

Session 1: July 13-17, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Session 2: December 15-19, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

3.0 CEUs (30 PDHs) AWARD

Course Reference

EE0242

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 Installation and Site Testing of Power Transformer. It covers the role of power transformers in the electrical power system; the different types of power transformers, insulation and foundations used in transformers; the basic principles of transformer operation and transformer losses; the different components of a power transformer and materials; the construction methods used in transformer manufacturing; selecting a transformer location and requirements for transformer ventilation and cooling; and the different types of transformer oils and oil tests used in transformer maintenance.

During this interactive course, participants will learn the transformer site tests, insulation resistance test and test procedure; the transformer turns ratio test and its importance in determining the transformer ratio and detecting transformer winding defects; the short circuit impedance test and the precautions and limitations associated with short circuit impedance testing; the sweep frequency response analysis (SFRA) in detecting transformer winding defects; detecting insulation defects in transformers using partial discharge (PD) test; the transformer maintenance, transformer life extension and transformer rewinding; and the replacement of bushings and tap changers and insulation upgrades.

Course Objectives

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

- Apply and gain an in-depth knowledge on the installation and site testing of power transformer
- Discuss the role of power transformers in the electrical power system
- Identify the different types of power transformers and insulation and foundations used in transformers
- Discuss the basic principles of transformer operation and transformer losses
- Recognize the different components of a power transformer and materials and construction methods used in transformer manufacturing
- Select a transformer location and identify requirements for transformer ventilation and cooling
- Recognize the different types of transformer oils and oil tests used in transformer maintenance
- Apply transformer site tests, insulation resistance test and test procedure
- Discuss the transformer turns ratio test and its importance in determining the transformer ratio and detecting transformer winding defects
- Employ short circuit impedance test and the precautions and limitations associated with short circuit impedance testing
- Apply sweep frequency response analysis (SFRA) in detecting transformer winding defects
- Detect insulation defects in transformers using partial discharge (PD) test
- Illustrate transformer maintenance, transformer life extension, transformer rewinding, replacement of bushings and tap changers, and insulation upgrades

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 installation and site testing of power transformer for electrical and mechanical/power engineers, project engineers, maintenance engineers and supervisor and operating staff of electrical sub stations.

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: -

- 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 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. Mike Southwood, PE, BSc, is an expert in **Power System Protective Relaying** with over **40 years** of practical experience within the **Power** industry. He is currently the **Chief Electrical Engineer** of **Eastern Power Ltd**. in Toronto, where he designs, builds and operates non-utility generating stations, **Power System** Equipment, **Power Systems & Auxiliary Power** Systems, **Power Cable** Standard and Testing, **Cables & Wiring**, **Overhead Transmission Lines**, **Transmission Network** Maintenance, **Electrical Forecasting** Techniques, **Inspection Reporting** Techniques, **Electrical Substation** Design & Planning, **Electrical Drawings** & **Schematics**, **Fault Detection** Analysis, **Distribution Networks** & **Load Forecasting**, **Power Generation**, **Electrical Power** System, **Electrical** Installations & Utilities, **Electrical Distribution Systems & Control Circuits**, **Electrical Drawings**, **Relay Logic Circuits**, Troubleshooting **Transformers**, **System Grounding**, **Circuit Breakers**, **Protection Devices & Technology**, **Protection Relay**, **Transformers**, **Generators**, **Power Transformers**, **Motors**, **Substations**, **Switchgears & Distribution**, **Power System** Analysis, **Power Quality** Studies & Load Criteria, **Power Supply** Substations, **Electrical Equipment** Control Systems, **Transformer Maintenance & Testing**, **HV/MV** Cable Splicing, Jointing, Inspection & Termination, **HV/LV** Equipment, **High Voltage Electrical Safety**, **LV & HV Electrical** System, **HV** Equipment Inspection & Maintenance, **HV Switchgear** Operation & Maintenance, **LV Distribution Switchgear & Equipment**, LV/MV Electrical Safety (**11 KV, 415 & 220 Voltage**), **Electrical Substation & Design**, **Substation Earthing System**, **Electrical Equipment** Maintenance, **Electrical Safety**, **Electrical Protection**, **Batteries**, **Chargers & UPS**, **Electrical Submersible Pumps** (**ESP**), Area Classification, Safety Management System, Permit to Work & Issuing Authority, Emergency **Diesel Generator**, **Variable Frequency Drives** (VFD), **PLC & SCADA** for Automation & Process Control, **Automation Solutions & Techniques**, **Automating Process Equipment**, **DCS** Automated Process Control Systems, High & Low Voltage **Electrical Safety**, **Electrical Inspection** & Testing, **Electrical Control** & Monitoring System, **Electric Power System**, Intensive Overhead **Transmission** Line (OHTL), **Generator** Maintenance & Troubleshooting, **Transmission** Line Networks, **Distribution** Engineering, HVDC **Transmission** & Control, **Substation** Maintenance Techniques and **Overhead Power Line** Construction & Patrolling.

During his career life, Mr. Southwood worked as a **Field Engineer** in the electricity supply industry at **Central Electricity Generating Board** in **England**, **Ontario Hydro** and **Eastern Power Ltd**. in **Toronto**. Further, he worked as a **Senior Protection** & **Control Engineer** wherein he was responsible for commissioning and maintenance of electrical equipment and protective relaying systems on major transmission and generation projects.

Mr. Southwood is a **Registered Professional Engineer** and has a **Bachelor** degree in **Electrical Engineering** from the **Salford University** (**UK**). Further, he is a **Certified Instructor/Trainer** and he has conducted numerous seminars/courses on power system protection for various industries and universities in several cities in North America and for various overseas electrical utilities.

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 Power Transformers*** *Define Power Transformers and their Role in the Electrical Power System • Different Types of Power Transformers, Including Step-up, Step-Down, Autotransformers, and Instrument Transformers • Basic Principles of Transformer Operation and Transformer Losses*
0930 – 0945	*Break*
0945 – 1100	***Transformer Design & Construction*** *Different Components of a Power Transformer, Including the Core, Windings and Tank*
1100 – 1230	***Transformer Design & Construction (cont'd)*** *Materials and Construction Methods Used in Transformer Manufacturing*
1230 – 1245	*Break*
1245 – 1420	***Transformer Design & Construction (cont'd)*** *Different Types of Insulation Used in Transformers and their Applications*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Transformer Installation*** *Different Factors that Need to be Considered when Selecting a Transformer Location • Different Types of Foundations Used in Transformer Installation and their Design Considerations*
0930 – 0945	*Break*
0945 – 1100	***Transformer Installation (cont'd)*** *Requirements for Transformer Ventilation and Cooling*

1100 – 1230	***Transformer Oil & Oil Testing*** *Different Types of Transformer Oils and their Properties • Importance of Transformer Oil in Transformer Performance and Longevity*
1230 – 1245	*Break*
1245 – 1420	***Transformer Oil & Oil Testing (cont'd)*** *Different Types of Oil Tests Used in Transformer Maintenance, Including Dissolved Gas Analysis, Acidity and Moisture Content*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Transformer Site Testing - Insulation Resistance Test*** *Different Types of Transformer Site Tests and their Purposes • Insulation Resistance Test and its Importance in Detecting Insulation Defects*
0930 – 0945	*Break*
0945 – 1100	***Transformer Site Testing - Insulation Resistance Test (cont'd)*** *Test Equipment Used in Insulation Resistance Testing and the Test Procedure*
1100 – 1230	***Transformer Site Testing - Transformer Turns Ratio Test*** *Transformer Turns Ratio Test and its Importance in Determining the Transformer Ratio and Detecting Transformer Winding Defects • Test Equipment Used in Turns Ratio Testing and the Test Procedure*
1230 – 1245	*Break*
1245 – 1420	***Transformer Site Testing - Transformer Turns Ratio Test (cont'd)*** *Precautions and Limitations Associated with Turns Ratio Testing*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Transformer Site Testing - Short Circuit Impedance Test*** *Short Circuit Impedance Test and its Importance in Determining the Transformer's Ability to Withstand Short Circuit Currents • Test Equipment Used in Short Circuit Impedance Testing and the Test Procedure*
0930 – 0945	*Break*
0945 – 1100	***Transformer Site Testing - Short Circuit Impedance Test (cont'd)*** *Precautions and Limitations Associated with Short Circuit Impedance Testing*
1100 – 1230	***Transformer Site Testing - Sweep Frequency Response Analysis (SFRA)*** *SFRA Test and its Importance in Detecting Transformer Winding Defects • Test Equipment Used in SFRA Testing and the Test Procedure*
1230 – 1245	*Break*
1245 – 1420	***Transformer Site Testing - Sweep Frequency Response Analysis (SFRA) (cont'd)*** *Interpretation of SFRA Test Results and the Actions to be Taken in Case of Abnormal Results*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Transformer Site Testing - Partial Discharge (PD) Testing*** *Partial Discharge (PD) Test and its Importance in Detecting Insulation Defects in Transformers*
0930 – 0945	*Break*
0945 – 1100	***Transformer Site Testing - Partial Discharge (PD) Testing (cont'd)*** *Different Types of PD Testing Methods and their Applications*
1100 – 1230	***Transformer Site Testing - Partial Discharge (PD) Testing (cont'd)*** *Test Equipment Used in PD Testing and the Test Procedure*
1230 – 1245	*Break*
1245 – 1345	***Transformer Maintenance & Life Extension*** *Different Types of Transformer Maintenance Activities And Their Frequency • Different Methods Used in Transformer Life Extension, Including Transformer Rewinding, Replacement of Bushing and Tap Changers, and Insulation Upgrades • Economic and Technical Consideration Associated with Transformer Life Extension*
1345 – 1400	***Course Conclusion***
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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