COURSE OVERVIEW EE0577
Power Technology

Course Title
Power Technology

Course Date/Venue
September 09-13, 2024/Meeting Plus 6, Khalidiya Palace Rayhaan by Rotana Hotel, Abu Dhabi, UAE

Course Reference
EE0577

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 Power Technology. It covers the power generation, transmission and distribution systems; the voltage, current, resistance and power relationships; the differences, advantages and applications of AC and DC power; the power generation methods and the components that make up the power grid including substations and transformers; and the safety in power generation and distribution and thermal power plants, hydroelectric power and nuclear power generation.

Further, the course will also discuss the renewable energy sources, distributed generation systems, energy storage solutions, power transmission systems and distribution networks; the smart grids, advanced metering, power quality and reliability; addressing issues like voltage stability, flicker and harmonics; the role and components of substations in power systems; and the protection of power systems against faults and failures.

During this interactive course, participants will learn the load forecasting management; the principles of electricity pricing, market structures and trading; the regulatory frameworks and the environmental challenges associated with power generation; the energy efficiency and conservation by reducing energy consumption and loss; integrating renewable energy sources and cutting-edge renewable energy technologies and their potential; the role of power technology in the development of smart cities; the impact of electric vehicles on power demand and distribution networks; and the energy blockchain, artificial intelligence and machine learning in power systems.

Course Objectives

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

- Apply and gain an in-depth knowledge on power technology
- Discuss power systems covering power generation, transmission, and distribution systems
- Identify voltage, current resistance and power relationships including the differences, advantages and applications of AC and DC power
- Carryout power generation methods and recognize the components that make up the power grid including substations and transformers
- Ensure safety in power generation and distribution and discuss thermal power plants, hydroelectric power and nuclear power generation
- Recognize renewable energy sources, distributed generation systems, energy storage solutions, power transmission systems and distribution networks
- Apply smart grids and advanced metering and power quality and reliability and address issues like voltage stability, flicker and harmonics
- Identify the role and components of substations in power systems and the protection of power systems against faults and failures
- Employ load forecasting and management and discuss the principles of electricity pricing, market structures and trading
- Review regulatory frameworks and address the environmental challenges associated with power generation
- Employ energy efficiency and conservation by reducing energy consumption and loss
- Integrate renewable energy sources and explore cutting-edge renewable energy technologies and their potential
- Identify the role of power technology in the development of smart cities including the impact of electric vehicles (EVs) on power demand and distribution networks
- Discuss energy blockchain, artificial intelligence and machine learning in power systems

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 power technology for managers, electrical engineers, power system engineers, and energy engineers who design, operate and maintain power systems.

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.

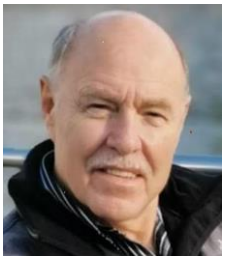
  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation 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 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. Fred Du Plessis is a **Senior Electrical Engineer** with over **45** years of extensive experience within the **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise widely covers in the areas of **Thermal Gas Power Generation**, **Power Station** Operations, **Power Generation Plant Outage** Management, **Power System** Analysis, **Power System** Generation & Distribution, **Electric Power System** Design, Maintenance, Testing & Troubleshooting, **Transformer Protection**, **Transformer** Problem and Failure Investigations, **Power System Operation and Control**, Fault Analysis in **Power Systems**, **HV/MV Cable Splicing**, **High Voltage Electrical Safety**, **High Voltage Circuit Breaker** Inspection & Repair, **High Voltage Power** System, **HV Equipment** Inspection & Maintenance, **HV Switchgear** Operation & Maintenance, Resin / **Heat Shrink & Cold Shrink** Joints, **HV/LV Equipment**, ORHVS for Responsible and Authorized Person **High Voltage Regulation**, **Transformers** Maintenance, inspections & repairs, Commissioning of **LV & HV Equipment**, Oil Purification and **High Voltage Maintenance**, HT Switch Gear - Testing, Safe Operating, Maintenance, Inspection & Repairs on **LV & HT Cables** - Testing (Pulse & Megger), Line Patrol in **Low Voltage & Distribution**, **Transmission**, **Operating Principles up to 132KV**, Abnormal Conditions & Exceptions, Commissioning & Testing, **Transformer Inspections & Repairs**, **Live Line Work up to 33KV**, **Basic Power System Protection**, **High Voltage** Operating Preparedness Phasing (**110V to 132KV**), **HV Operating & Fault** Finding (up to 132KV), Maintenance & Construction Supervision, **VSD/VFD** Installations & Testing, **Electrical Panel Design**, **VSD/VFD Installations & Testing**, Instrument Installation and wiring, **AC/DC Supplies & Change Over Systems**, **AC & DC Winders** and VLF Testing, **Gas Turbines**, **Steam Turbine** with a **Station Generation**, **Project** Management & Project Controls, **Water Treatment & Reverse Osmosis** Plant Management and **Mechanical Maintenance** Management.

During Mr. Du Plessis's career life, he has gained his practical experience through several significant positions and dedication as the **Project Manager/Owner**, **Maintenance Manager**, **Project Excecution Manager**, **Commissioning & Operating Manager**, **Acting Operating Manager**, **Optimization/Commissioning Manager**, **Operating Support Manager**, **Operating Production/Shift Manager**, **Operations Lead Engineer**, **Electrical Engineer**, **Production/Maintenance Planner**, **Unit Shift Supervisor**, Principal **Plant Operator**, **Workshop & Maintenace Consultant**, Assistant **Electrical Supervisor**, Trainee **Motor Mechanic** and **Senior Instructor/Trainer** from various international **power station** companies like the Dunamis Energy, Peterhead Power Station, Lijaco Services, Eskom, Matla Power Station, Grootvlei Power Station, Ellisras Brick & Ceramic, Hlalisanani Mechanical Contractor, Matimba Power Station, Matimba Power Station, Eskom Kriel Power Station and Transvaal Provincial.

Mr. Du Plessis has a **Bachelor's** (with Honours) degree in **Operations Management**. Further, he holds certification in Red & Silver Seal Accreditation Power Generation – (ESETA), a SAMTRAC & NOSA **Auditor** – (NOSA), a **Certified Instructor/Trainer** and has further delivered various trainings, seminars, conferences, workshops and courses globally.

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 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: ***Monday, 09th of September 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Power Systems:*** *Power Generation, Transmission, and Distribution Systems*
0930 – 0945	*Break*
0945 – 1030	***Electricity Basics:*** *Voltage, Current, Resistance, and Power Relationships*
1030 – 1115	***AC versus DC Power:*** *The Differences, Advantages, and Applications of AC and DC Power*
1115 – 1200	***Power Generation Methods:*** *Conventional and Renewable Power Generation Technologies*
1200 – 1215	*Break*
1215 – 1315	***Grid Structure & Components:*** *The Components that Make Up the Power Grid, including Substations and Transformers*
1315 – 1420	***Power System Safety:*** *Best Practices for Ensuring Safety in Power Generation and Distribution*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2:	Tuesday, 10th of September 2024
0730 – 0830	**Thermal Power Plants:** Operation Principles and Components of Coal, Gas, and Oil-Fired Power Plants
0830 – 0930	**Hydroelectric Power:** The Design and Operation of Hydroelectric Power Generation
0930 – 0945	Break
0945 – 1100	**Nuclear Power Generation:** Basics of Nuclear Reactors, Safety Measures, and Environmental Considerations
1100 – 1200	**Renewable Energy Sources:** Detailed Exploration of Solar, Wind, Biomass, and Geothermal Power Generation
1200 – 1215	Break
1215 – 1315	**Distributed Generation Systems:** Introduction to Small-Scale Power Generation Technologies and Microgrids
1315 – 1420	**Energy Storage Solutions:** Energy Storage Technologies, including Batteries and Pumped Storage
1420 – 1430	**Recap**
1430	Lunch & End of Day Two

Day 3:	Wednesday, 11th of September 2024
0730 – 0830	**Power Transmission Systems:** Design and Operation of High-Voltage Transmission Networks
0830 – 0930	**Distribution Networks:** The Distribution of Power to End-Users
0930 – 0945	Break
0945 – 1100	**Smart Grids & Advanced Metering:** Technologies for Modernizing the Power Grid and Enhancing Efficiency
1100 – 1200	**Power Quality & Reliability:** Addressing Issues Like Voltage Stability, Flicker, and Harmonics
1200 – 1215	Break
1215 – 1315	**Electrical Substations:** Role and Components of Substations in Power Systems
1315 – 1420	**Protection Systems:** The Protection of Power Systems Against Faults and Failures
1420 – 1430	**Recap**
1430	Lunch & End of Day Three

Day 4:	Thursday, 12th of September 2024
0730 – 0830	**Load Forecasting & Management:** Techniques for Predicting and Managing Electrical Load
0830 – 0930	**Power Economics & Market:** Principles of Electricity Pricing, Market Structures, and Trading
0930 – 0945	Break
0945 – 1100	**Regulatory Frameworks:** Policies Governing Power Generation and Distribution
1100 – 1200	**Environmental Impact of Power Systems:** Addressing the Environmental Challenges Associated with Power Generation
1200 – 1215	Break
1215 – 1315	**Energy Efficiency & Conservation:** Strategies for Reducing Energy Consumption and Loss
1315 – 1420	**Integration of Renewable Energy Sources:** Challenges and Strategies for Integrating Renewables into the Grid
1420 – 1430	**Recap**
1430	Lunch & End of Day Four

Day 5:	***Friday, 13th of September 2024***
0730 – 0830	***Advanced Renewable Technologies:*** *Exploring Cutting-Edge Renewable Energy Technologies and their Potential*
0830 – 0930	***Smart Cities & Infrastructure:*** *Role of Power Technology in the Development of Smart Cities*
0930 – 0945	*Break*
0945 – 1100	***Electric Vehicles & Infrastructure:*** *Impact of EVs On Power Demand and Distribution Networks*
1100 – 1200	***Energy Blockchain:*** *Use of Blockchain in Power Systems for Enhanced Efficiency and Reliability*
1200 – 1215	*Break*
1215 – 1345	***Artificial Intelligence & Machine Learning in Power Systems:*** *Applications for Predictive Maintenance, Load Forecasting, and Grid Management*
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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