COURSE OVERVIEW EE0167
Hazardous Area Classification & Intrinsic Safety

Course Title
Hazardous Area Classification & Intrinsic Safety

Course Date/Venue
January 14-18, 2024/Oryx 1 Meeting Room, Wyndham Grand Doha West Bay Beach, Doha, Qatar

3.0 CEUs (30 PDHs) AWARD

Course Reference
EE0167

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 offer a working knowledge in the Hazardous Area Classification with respects to Electrical and Instrumentation control. The objective of hazardous area classification is to identify areas in a plant where flammable atmospheres may exist and to determine their likely extent. From this, the risk of ignition from electrical apparatus in the areas can be minimized by specification of a suitable degree of protection for such apparatus.

In this course, you will learn about the regulations, guidance and standards for the classification of hazardous areas. The hazards of fires and explosions will be introduced, together with the sources of ignition arising from electrical apparatus. Further an approach to defining the type of zone will be introduced, together with the criteria for determining the extent of zones. Practical examples will be used to illustrate the principles presented in the lectures.

Further, this course will cover the classification of hazardous areas in situations where flammable atmospheres arise from the presence of both combustible dusts and flammable gases and vapours. The levels of protection for electrical apparatus appropriate for use in hazardous zones will be discussed in some detail, together with the importance of ensuring that these levels of protection are maintained throughout the lifetime of the equipment.

This course presents information on division and zone classification schemes and explains the electrical equipment and wiring methods that are allowed within classified areas at operation and production locations. Material presented is primarily from IEC 60079, ATEX Directive 99/92/EC (ATEX 137), ATEX Directive 94/91/EC (ATEX 95), API RP 500, and API RP505, and includes standards and recommended practices published by IEEE and ISA. A syndicate exercise, followed by interactive discussion, will be used to help delegates to appreciate the principles presented in the course.

Course Objectives

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

- Apply the correct hazardous area classification and classify the hazardous materials and the control of ignition sources as per standards
- Implement the Hazardous Area Classification (HAC) Standards including the IEC 60079, ATEX 95, ATEX 137, API RP 500, API RP 505, IEEE and ISA
- Reduce the risk of fires and explosions and control the sources of ignition arising from electrical apparatus in the plant
- Select the proper electrical & control equipment in hazardous areas
- Explain the relation between area classification and the various ex apparatus as well as the relation between classification and equipment's voltage
- Enumerate the different temperature & gas group classification, flammable mixture, mig. Explosion and various EX apparatus
- Execute installation of the different types of equipments which include flameproof and N" types
- Give emphasis on equipment maintenance recommendations in hazardous areas including the documentation of hazardous area by reading P & ID
- Heighten awareness on new equipment and innovation in the fields for hazardous area classification

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 hazardous area classification and intrinsic safety in accordance with IEC 60079, ATEX 95/137 and API RP 500/505. Electrical, control and safety managers, engineers and other technical staff will definitely benefit from the international standards and regulation part of the course.

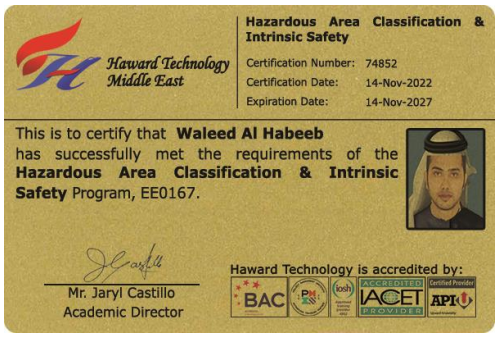
Course Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards 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 Middle East

Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Nov-22

HTME No. 74852

Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
EE0167	Hazardous Area Classification & Intrinsic Safety	November 10-14, 2022	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

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org

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$ 6,500 per Delegate. 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 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 Hazardous Area Classification (**HAC**), **Temperature Classification**, Ingress Protection (**IP**), **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, **Circuit Breaker**, **HV Switchgear Operation & Maintenance**, **HV/LV Equipment**, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipments Inspection & Maintenance**, **LV Distribution Switchgear & Equipment**, **Power Generation Operation & Control**, **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.

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: ***Sunday, 14th of January 2024***

0730 – 0800	*Registration & Coffee,*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***General Principles/Introduction to Hazardous Area Classification*** *Defining Hazardous Areas (Zoning)*
0930 – 0945	*Break*
0945 – 1045	***Hazardous Area Classification (HAC)*** *Why Area Classification?*
1045 – 1200	***Hazardous Area Classification (HAC) (cont'd)*** *Classifying Hazardous Materials*
1200 – 1215	*Break*
1215 – 1420	***Hazardous Area Classification (HAC) (cont'd)*** *Ignition Sources – Identification and Control*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 15th of January 2024***

0730 – 0930	***Hazardous Area Classification (HAC) Standards*** *BS EN 60079-10 ● ATEX 95 ● ATEX 137 ● API RP 500 ● North American Hazard Area Category ● North American NEC Article for Gas Grouping ● Typical Gas Hazard*
0930 – 0945	*Break*
0945 – 1045	***Hazardous Area Classification (HAC) Standards (cont'd)*** *North America/NEC500-503 ● API RP 505 ● IEEE ● ISA*
1045 – 1200	***Identify & Reduce/Eliminate the Risk***
1200 – 1215	*Break*
1215 – 1315	***Selection of Electrical Equipment in Hazardous Areas***
1315 – 1420	***IEC/CENELEC/EUROPE/NEC505+***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3:	Tuesday, 16th of January 2024
0730 – 0930	***Ingress Protection (IP) Codes and NEMA Types***
0930 – 0945	*Break*
0945 – 1045	***NEMA & UL Types of Enclosures***
1045 – 1200	***The Relation Between Area Classification & The Various Ex Apparatus***
1200 – 1215	*Break*
1215 – 1420	***The Relation Between Classification & Equipment's Voltage***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4:	Wednesday, 17th of January 2024
0730 – 0830	***Temperature & Gas Group Classification***
0830 – 0930	***Flammable Mixture, Mig. Explosion, Various EX Apparatus***
0930 – 0945	*Break*
0945 – 1045	***Installation of Different Types Equipments*** *Flameproof (Explosion-proof) ● N" Types*
1045 – 1200	***Zones, Divisions & Safety Categories***
1200 – 1215	*Break*
1215 – 1315	***Methods of Explosion Protection***
1315 – 1420	***Explosion Protection in North America*** *Regulation in North America ● Class I, zone 0, 1 and 2 Locations ● Classification of Locations ● Material Groups ● Temperature Classification ● Protection Techniques ● Markings for IEC-based zone certification*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: :	Thursday, 18th of January 2024
0730 – 0930	***Equipment Maintenance Recommendations in Hazardous Area***
0930 – 0945	*Break*
0945 – 1045	***Documentation of Hazardous Area- Reading P &ID***
1045 – 1200	***New Equipment & Innovation in the Fields***
1200 – 1215	*Break*
1215 – 1300	***Summary, Open Forum & Closure***
1300 – 1315	***Course Conclusion***
1315 – 1415	***COMPETENCY EXAM***
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

Jaryl Castillo, Tel: +974 4423 1327, Email: jaryl@haward.org