

## COURSE OVERVIEW EE0221

### Hazardous Area Equipment Inspection & Maintenance Certification

**Course Title**

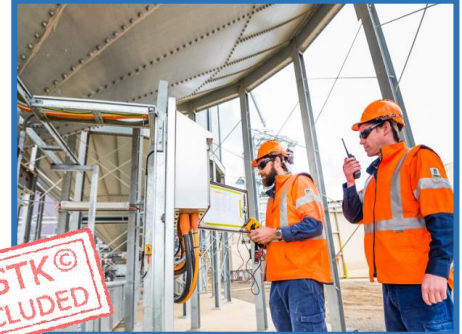
Hazardous Area Equipment Inspection & Maintenance Certification

**Course Reference**

EE0221

**Course Duration/Credits**

Five days/3.0 CEUs/30 PDHs



**Course Date/Venue**

Sessions	Date	Venue
1	March 03-07, 2024	Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA
2	June 23-27, 2024	Club B, Ramada Plaza By Wyndham Istanbul City Center, Istanbul, Turkey
3	September 08-12, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
4	December 16-20, 2024	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

**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 hazardous equipment inspection and maintenance. It covers the hazardous area classification; the zones for hazardous area classification (HAC) and apparatus classification; the apparatus grouping and temperature, Ex protection principles and flameproof concept Ex d; the hazardous area classification (HAC) standards; the electrical hazards, earthing, bonding and testing; the certification, certificates, marking and approval; and the code of practice for selection and installation of Ex equipment installation.



During this interactive course, participants will learn the relation between area classification, various Ex apparatus, equipment's voltage, temperature and gas classification; the installation of different types of equipment and interconnecting cabling; the maintenance, inspection, fault finding and repairs of Ex equipment; the test equipment suitability and equipment maintenance recommendations in hazardous area; reading of P&ID in hazardous area documentation, inspection and maintenance of explosion proof instruments; the maintenance of intrinsically safe equipment and purged/pressurized equipment; the risk analysis, assessment and management (QRA); the integrated safety management; and the hazard and operability (HAZOP) process and guidelines.

### Course Objectives

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

- Apply and gain an in-depth knowledge on hazardous equipment inspection and maintenance
- Discuss hazardous area classification covering explosion consequences, properties of gases, flammable gases, vapours, ignition sources and protection requirements
- Define zones for hazardous area classification (HAC) and classify apparatus
- Describe apparatus grouping and temperature, Ex protection principles and flameproof concept Ex d
- Apply hazardous area classification (HAC) in accordance with BS EN 6007-10, ATEX 95, ATEX 137 API RP 500, North America/NEC500-503, API RP 505, IEEE, ISA, etc. standards
- Identify electrical hazards, earthing, bonding and testing including basic principles, IS systems requirements, noise and interface control and earthing requirements
- Employ system earthing approach, static protection and lightning protection
- Employ certification, certificates, marking and approval of systems approach, safety descriptions, codes of practice, national standards, hazardous area classification (HAC) standards
- Apply code of practice for selection and installation of Ex equipment installation
- Discuss the relation between area classification, various Ex apparatus and equipment's voltage as well as classify temperature and gas
- Install different types of equipment and interconnect cabling
- Carryout maintenance, inspection, fault finding and repairs of Ex equipment through use of tools procedures and safe methods
- Describe test equipment suitability and equipment maintenance recommendations in hazardous area
- Read P&ID in hazardous area documentation, inspect and maintain explosion proof instruments
- Maintain intrinsically safe equipment and purged/pressurized equipment
- Carryout risk analysis, assessment and management (QRA)
- Discuss the integrated safety management plan as well as the hazard and operability (HAZOP) process and guidelines

### 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 equipment inspection and maintenance for engineers and technicians.

**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.

Page 1 of 1

**CEUs**

**Haward Technology Middle East**  
Continuing Professional Development (HTME-CPD)

**CEU Official Transcript of Records**

**TOR Issuance Date:** 09-Feb-17  
**HTME No.** PAR11317  
**Participant Name:** Mohammad Ali

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
EE0221-IH	Hazardous Area Equipment Inspection & Maintenance Certification	February 05-09, 2017	32.5	3.25
<b>Total No. of CEU's Earned as of TOR Issuance Date</b>				<b>3.25</b>

**TRUE COPY**

  
 Maricel De Guzman  
 Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 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 1-2013 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: -

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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.

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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.

### 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 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 **25 years** of **Onshore & Offshore** experience within the **Oil & Gas, Refinery, Petrochemical** and **Power** industries. His wide expertise covers **HV Cable Design, Cable Splicing & Termination, Cable Jointing Techniques, High Voltage Electrical Safety, HV/MV Cable Splicing, High Voltage Circuit Breaker Inspection & Repair, High Voltage Power System Safe Operation, High Voltage Safety, High Voltage Transformers, Safe Operation of High**

**Voltage & Low Voltage Power Systems, Electric Distribution System Equipment, Practical Troubleshooting of Electrical Equipment & Control Circuits, Electrical & Control System Testing & Commissioning, LV/MV/HV Circuit Breakers Inspection & Maintenance, Electrical Power Substation Maintenance, Practical High Voltage Safety Operating Procedures, Modern Power System Protective Relaying, Electrical & Control System Testing, Design, Commissioning, Operation and Maintenance of Switchgears, Transformers, Substations, Medium & High Voltage Equipment and Circuit Breakers, 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, Assistant General Technical Manager, Electronics & Instruments Head, Electrical Power & Machine Expert, Electrical Process Leader, Team Leader, Electrical Team Leader, Electronics & Instruments Maintenance Superintendent, Engineering Supervisor, 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** 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

Al Khobar	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	<b>US\$ 6,000</b> per Delegate + <b>VAT</b> . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . 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 &amp; Coffee</i>
0800 - 0815	<i>Welcome &amp; Introduction</i>
0815 - 0830	<b>PRE-TEST</b>
0830 - 0930	<b>Introduction to Hazardous Area Classification</b> <i>Explosion Consequences • Definition of Hazardous Area (Zoning) • Properties of Gases • Flammable Gases, Vapours and Ignition Sources • Protection Requirements</i>
0930 - 0945	<i>Break</i>
0945 - 1100	<b>Zones &amp; Definitions</b> <i>Hazardous Area Classification (HAC) • Classification of Apparatus • Apparatus Grouping and Temperature • Principles of Ex Protection • Flameproof Concept Ex d</i>
1100 - 1230	<b>Hazardous Area Classification (HAC) Standards</b> <i>BS EN 60079-10 • ATEX 95 • ATEX 137 • API RP 500 • North American Hazard Area Category</i>
1230 - 1245	<i>Break</i>
1245 - 1420	<b>Hazardous Area Classification (HAC) Standards (cont'd)</b> <i>North American NEC Article for Gas Grouping • Typical Gas Hazard • North America/NEC500-503 • API RP 505 • IEEE • ISA</i>
1420 - 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>

#### **Day 2**

0730 - 0930	<b>Electrical Hazards, Earthing &amp; Bonding &amp; Testing</b> <i>Basic Principles • Requirements for IS Systems • Noise and Interference Control • Earthing Requirements • System Earthing Approach • Static Protection • Lightning Protection</i>
0930 - 0945	<i>Break</i>
0945 - 1100	<b>Certification, Certificates, Marking &amp; Approval</b> <i>Authorities • Marking and Identification • Apparatus Certification • Systems Certification • Systems Descriptive Documentation • Interconnected apparatus</i>

1100 - 1230	<b>Certification, Certificates, Marking &amp; Approval (cont'd)</b> Systems Approach • Safety Descriptions • Codes of Practice • National Standards • Hazardous Area Classification (HAC) Standards
1230 - 1245	Break
12405- 1420	<b>Code of Practice for Selection &amp; Installation of Ex Equipment Installation</b> Selection of Electrical Equipment in Hazardous Areas • The Relation Between Area Classification and The Various Ex Apparatus • The Relation Between Classification and Equipment's Voltage • Temperature & Gas Group Classification
1420 - 1430	<b>Recap</b>
1430	Lunch & End of Day Two

### Day 3

0730 - 0930	<b>Code of Practice for Selection &amp; Installation of Ex Equipment Installation (cont'd)</b> Flammable Mixture, Mig. Explosion, Various Ex Apparatus • Installation of Different Types of Equipments • Safe Area Requirements
0930 - 0945	Break
0945 - 1100	<b>Code of Practice for Selection &amp; Installation of Ex Equipment Installation (cont'd)</b> Interconnecting Cabling • Hazardous Area Junction Boxes • Hazardous Area Apparatus
1100 - 1230	<b>Maintenance, Inspection, Fault Finding &amp; Repairs of Ex Equipment</b> Maintenance – Introduction • Planned Maintenance • Use of Tools Procedures
1230 - 1245	Break
12405- 1420	<b>Maintenance, Inspection, Fault Finding &amp; Repairs of Ex Equipment (cont'd)</b> Safe Methods • Test Equipment Suitability • Equipment Maintenance Recommendations in Hazardous Area
1420 - 1430	<b>Recap</b>
1430	Lunch & End of Day Three

### Day 4

0730 - 0930	<b>Maintenance, Inspection, Fault Finding &amp; Repairs of Ex Equipment (cont'd)</b> Documentation of Hazardous Area-Reading P&ID • Maintenance – General Guidelines – 1 • Maintenance – General Guidelines – 2
0930 - 0945	Break
0945 - 1100	<b>Maintenance, Inspection, Fault Finding &amp; Repairs of Ex Equipment (cont'd)</b> Inspection • Maintenance of Explosion Proof Instruments/Equipment – 1 • Maintenance of Explosion Proof Instruments/Equipment – 2
1100 - 1230	<b>Maintenance, Inspection, Fault Finding &amp; Repairs of Ex Equipment (cont'd)</b> Inspection of Explosion Proof Equipment • Maintenance of Increased Safety Equipment • Maintenance of Intrinsically Safe Equipment – 1
1230 - 1245	Break
12405- 1420	<b>Maintenance, Inspection, Fault Finding &amp; Repairs of Ex Equipment (cont'd)</b> Maintenance of Intrinsically Safe Equipment – 2 • Maintenance of Intrinsically Safe Equipment – 3 • Maintenance of Purged/Pressurized Equipment
1420 - 1430	<b>Recap</b>
1430	Lunch & End of Day Four



**Day 5**

0730 - 0930	<b>Risk Analysis, Assessment &amp; Management (QRA)</b> <i>Probability Basics • Probabilistic Risk Assessment Concepts and Methodology • Fault Tree and Event Tree Analysis • Quantitative Risk Assessment Concepts and Methodology</i>
0930 - 0945	<i>Break</i>
0945 - 1100	<b>Integrated Safety Management Plan</b> <i>Hazard and Effect Management Plan • Bow-Tie Process • Risk Matrix • Determining Acceptability of Risk</i>
1100 - 1215	<b>Hazard &amp; Operability (HAZOP) Reviews</b> <i>Process and Guidelines</i>
1215 - 1230	<i>Break</i>
1230 - 1300	<b>ATEX Directive</b> <i>Scope of Directive • Group I Mining (M1 &amp; M2) • Group II Non-mining (1G or 1D/2G or 2D/3G or 3D) • Verifying Conformity</i>
1300- 1315	<b>Course Conclusion</b>
1315 - 1415	<b>COMPETENCY EXAM</b>
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch &amp; End of Course</i>

**Practical Sessions**

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



**Course Coordinator**

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