COURSE OVERVIEW HE0002
Process Hazard Analysis

Course Title
Process Hazard Analysis

Course Date/Venue
August 10-14, 2025/Tamra Meeting Room, Al Bandar Rotana Creek, Dubai UAE

Course Reference
HE0002

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.

Old approaches to safe design in the process industry relied on the application of codes of practice and the design was usually based upon experience from specialists and operators in the industry. Such methods were able only to take into account problems and accidents that had already happened. With introduction of new technologies, unconventional design, complex plants and short operating experience, a proper PHA study is now a mandatory tool to identify potential hazards and operability problems.

PHA is a systematic multidisciplinary team study intended to identify and analyze the significance of potential process hazards and make initial recommendations for eliminating hazards, for reducing the consequences of potential accidents and for improving general facility safety.

PHA methods are used for new plants as well as for modifications to existing design. The methods have been developed primarily for the process industry and have been applied in great scale in the Oil and Gas sector. However, the PHA techniques are now applied with success for other industries such as offshore construction, power and water projects, space and military industries, and environment studies.

This course is designed to provide the participants with the knowledge and group leadership skills to lead teams in effective Process Hazards Analysis (PHA) studies. The course is based on OSHA 29CFR Part 1910 Process Safety Management (PSM) regulations and was developed using instruction techniques and audio-visual materials specifically designed for engineers and supervisors. There is a focus on developing a practical understanding of what it takes to plan and lead a successful study and on practicing new skills. Participants will be provided with comprehensive training and resource materials.

Course Objectives

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

- Get certified as a *"Certified HAZOP Leader"*
- Apply the methodology of the PHA review techniques in general and the HAZOP technique in particular based on the International Standard IEC 61882 and identify the role of the independent chairman and the HAZOP team
- Determine the minimum Engineering Documents and drawings required to complete a satisfactory HAZOP report and illustrate the structure and content of such report
- Apply the HAZOP tool to process design of existing or new facilities including interface, start up and commissioning of a plant
- Assess the risk level/criticality associated with control loop/equipment failure and practice the major techniques for hazard identification
- List the responsibilities involved in the PHA leadership and the skills necessary for leading PHA studies
- Practice the various PHA techniques including What-If, HAZOP and FMEA using real life cases and use commercial software as useful tools in the facilitation of Process Hazards Analysis

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 PHA for those who are involved in the management, engineering (design, process, chemical, facilities, instrumentation and control), operations and safety of process operations. Engineers, safety/environment personnel, plant operators, area managers, projects and maintenance personnel will benefit from the practical approach presented in this 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. Successful candidate will be certified as a "*Certified HAZOP Leader*". 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-24

HTME No. 74851

Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
HE0002	Process Hazard Analysis	Nov 10-14, 2024	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

Haward's certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

- 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.

Course Instructor

This course will be conducted by the following instructor. However, we have the right to change the course instructor prior to the course date and inform participants accordingly:

Mr. Andrew Ladwig is a **Senior Process & Safety Engineer** with over **25 years** of extensive experience within the **Oil & Gas**, **Refinery**, **Petrochemical & Power** industries. His expertise widely covers in the areas of **PHA**, **HAZOP**, **HAZCOM**, **HAZMAT**, **HAZID**, **Behavior Based Safety**, **Hazardous Materials & Chemicals** Handling, **Pollution Control**, **Environment, Health & Safety** Management, **Process Risk** Analysis, **Hazard & Risk Assessment**, **Emergency Response Procedures** Behavioural Based Safety (**BBS**), **Confined Space Entry**, **Fall Protection**, **Emergency Response**, H_2S, Safety Management System (**ISO 45001**), **Accident/Incident Investigation** System and Report PSM, **Risk Assessment**, **SCE FMEA Failure Investigations**, Site Management Safety Training (**SMSTS**), **Occupational Health & Safety and Industrial Hygiene, Crisis Management & Damage Control** in Oil & Gas Industry, **Enhancing HSSE Safety Performance & Effectiveness**, **Overhead & Gantry Crane Safety**, **HSSE Principles & Practices Advanced**, **HAZOP** Study, Sampling & Analysis, **Training** Analysis, **Job Analysis** Techniques, Storage & Handling of **Toxic Chemicals & Hazardous Materials**, **Hazardous Material** Classification & Storage/Disposal, **Dangerous Goods**, Environmental Management System (**EMS**). Further, he is also well-versed in **Ammonia Manufacturing & Process Troubleshooting**, **Ammonia Storage & Loading** Systems, **Ammonia Plant** Operation, Troubleshooting & Optimization, **Ammonia Recovery**, **Ammonia Plant Safety**, Hazard of **Ammonia Handling**, Storage & Shipping, **Operational Excellence** in **Ammonia Plants**, **Fertilizer Storage** Management (Ammonia & Urea), **Fertilizer Manufacturing** Process Technology, **Sulphur Recovery**, Phenol Recovery & Extraction, **Wax Sweating & Blending**, **Petrochemical & Fertilizer** Plants, **Nitrogen Fertilizer** Production, **Petroleum Industry Process** Engineering, **Separators** in **Oil & Gas** Industry, **Gas Testing & Energy** Isolations, Gas Liquor Separation, **Industrial Liquid Mixing**, **Wax Bleachers**, **Extractors**, **Fractionation**, Operation & Control of **Distillation**, Process of **Crude ATM & Vacuum Distillation** Unit, **Water Purification**, **Steam & Electricity**, **Flame Arrestors** and **Coal Processing**, **Environmental Emission Control**.

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer**, **Project Engineer**, **Reliability & Maintenance Engineer**, **Maintenance Support Engineer**, **Process Engineer**, **HSE Supervisor**, **Warehouse Manager**, **Quality Manager**, **Business Analyst**, **Senior Process Controller**, **Process Controller**, **Safety Officer**, **Mechanical Technician**, **Senior Lecturer** and **Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's** degree in **Chemical Engineering** and a **Diploma** in **Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and has delivered various trainings, workshops, seminars, courses and conferences internationally.

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 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, 10th of August 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***PHA-HAZOP Leadership & Management Facilitation & Competency***
0930 – 0945	*Break*
0945 – 1100	***Secrets of Successful HAZOP Facilitating & Scribing*** *Be Prepared ● Anticipate Issues ● Manage Expectations ● Consider Pre-Populating ● Stay Focused ● Look Ahead ● Clarify and Confirm ● Adapt to Different Styles ● Conclusion*
1100 – 1230	***Building Competency in Internal PHA/HAZOP Leaders*** *Developing and Maintaining Organization ● Developing, Measuring and Maintaining Individual Competency ● Content and Goal of Each Training Module and Follow-on Coaching*
1230 – 1245	*Break*
1245 – 1420	***Building Competency in Internal PHA/HAZOP Leaders (cont'd)*** *Case Studies – Examples of Results Achieved on Building PHA/HAZOP Competency ● Acronyms Used ● Minimum PHA Leadership Competency Requirements within PII*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2:	***Monday, 11tht of August 2025***
0730 – 0930	***PHA-HAZOP Leadership & Management, Leadership Principles & Management*** *HAZOP Leadership Principles*
0930 – 0945	*Break*
0945 – 1100	***PHA-HAZOP Leadership & Management, Leadership Principles & Management (cont'd)*** *HAZOP Management*
1100 – 1230	***PHA-HAZOP Study Preparations*** *What is Hazard ● What is Risk? ● Likelihood of Occurrence (Qualitative & Quantitative) ● Severity Definitions (Qualitative) ● Process Hazard Analysis ● Hazard Reduction Techniques ● Risk Assessment Options*
1230 – 1245	*Break*
1245 – 1315	***PHA-HAZOP Study Preparations (cont'd)*** *8 Steps for Risk Management ● Layers of Protection ● Triggers for Early Management Risk Review ● Information Required for Early Reviews ● Prepare for the Review ● More Detailed List of Desired Information ● Detailed List*
1315 – 1420	***Fundamentals of Risk Assessment*** *Hazard Classification & Control ● PSM Summary ● Risk Management ● What Do we mean by "Risk"? ● As Low as Reasonably Practicable (ALARP) ● Risk Concepts ● Risk Significance ● 100% Safe?*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3:	***Tuesday, 12th of August 2025***
0730 – 0930	***Risk Assessment Process*** *Risk Assessment ● When/Why do Risk Assessment? ● The Basic Steps of a PRA ● The Basic Steps of a QRA ● Frequency Analysis ● The Fault Tree, The Event, and the Event Tree ● Fault Tree Analysis ● Sample Event Tree ● Sources of Data*
0930 – 0945	*Break*
0945 – 1045	***Risk Significance (Measure)*** *Relative vs. Absolute ● The Basic Steps of A QRA ● Risk Measure ● Fatal Accident Rate ● Common FAR Figures (UK) ● Safety Layer of Protection Analysis ● Risk Acceptability Template ● Safety Integrity Level ● Risk Analysis ● Risk Assessment ● Fault and Event Trees ● Examples of Risk Measures ● A Multimedia, Multiple Pathway Exposure Model ● HIRA Procedure ● Risk Management Without or With Numbers ● Risk Management Without Numbers ● As Low as Reasonably Practicable ● Meaning of ALARP ● Definition of ALARP ● Levels of Risk and ALARP ● Risk Matrix ● Risk Significance ● Risk Calculator-Easy Program ● Risk Acceptance Graph ● Hazard Effects Management Process (HEMP) ● Bow Tie ● The Swiss Cheese Model of Accident Causation (Reason) ● Safety Management Based on the Reason Model ● Safety Management Cycle ● The Basic Steps of a QRA ● Acceptability of Risk ● Risk Mitigation*

1045 – 1115	***HAZID (Hazard Identification)*** *Introduction-HAZID (Hazard Identification) ● The Basic Steps of a PHA ● The Basic Steps of a QRA*
1115 - 1230	***Consequence Analysis*** *The Basic Steps of QRA ● Consequence Analysis Process ● Consequence Analysis Involves Estimating ● Computer Models ● The Basic Steps of a PHA ● HAZID requirements ● HAZID Approach ● Consultation*
1230 – 1245	***Break***
1245 – 1420	***Conducting the HAZID*** *HAZID Team Selection ● HAZID Study Team ● HAZID Team Planning ● Conducting the HAZID – Consider the Past, Present and Future ● Conducting the HAZID – HAZID Process ● HAZID Techniques ● Checklists*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 13th of August 2025

0730 – 0800	***Conducting the HAZID (cont'd)*** *Brainstorm ● What if ● HAZOP ● Task Analysis ● Fault Tree Analysis ● Review and Revision ● Sources of Additional Information*
0800 – 0945	***The PHA-HAZOP Study Team*** *The PHA Team ● Selection of the Team ● Guidance for PHA Leaders*
0945 – 1000	*Break*
1000 – 1100	***The HAZOP Study*** *Origins and Guidance of HAZOP ● Purpose of HAZOP ● HAZOP Methodology ● Most Important Source for study: P & ID Diagram ● Example of Line by Line Study ● Objectives of HAZOP Studies ● Four Basic Steps for HAZOP Studies ● A HAZOP Study has 5 Steps ● HAZOP Study Procedures ● Principle of the HAZOP Examination Phase ● Basic Guidewords ● Derived Guide Word for Deviations ● Examination Phase of HAZOP Study ● Choosing the Parts/Nodes for Study ● Choosing the "Parts" for Study*
1100 – 1230	***The HAZOP Study (cont'd)*** *Concept of Change Paths ● Change Path Concepts ● Choosing the Parts/Nodes: Guidelines ● Deviations Applied to the Change Path ● Change Path Example for Assembly Task ● Parts and Elements ● Examples of Elements in a Part ● Getting Started: Choosing the Parts and the Elements ● Creating Deviations ● Line by Line Study ● Creating Deviations: Guideword/Element Matrix Example ● Elements First Examination Procedure ● Guideword First Examination Procedure ● HAZOP Procedure*
1230 – 1245	*Break*
1245 – 1300	***Video: HAZOP***
1300 – 1330	***Developing of Specific Guidewords & Deviations*** *Process Description ● Logical Steps in the Processing of Each Deviations*

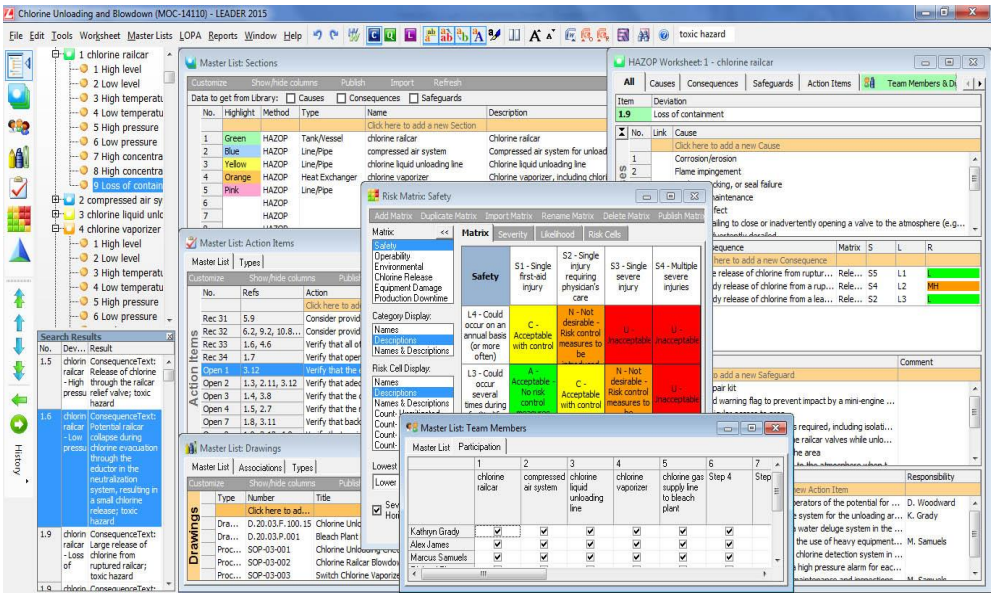
1330 – 1420	***Identify Causes, Consequences & Actions for Deviations*** *Process Description ● Examples of Deviation Test ● Complete the Following HAZOP Worksheet ● Examples of Element First Examination Method ● Worksheet Formats ● Causes of Deviations ● Evaluating EUC Risks ● Example of a Safeguard in Place: Boiler Drum Level ● Example of a Safeguard in Place: Definitions ● Worksheet Example for Drum Level Hazard ● Recommendation/Actions ● Documenting the HAZOP ● Conclusions ● Points to Note for the Examination Work ● What is HAZOP? ● When to Perform a HAZOP? ● HAZOP Background ● Standards and Guidelines ● Types of HAZOP*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5: ***Thursday, 20th of February 2025***

0730 – 0800	***HAZOP Team & Meetings*** *Team Members and Responsibilities ● Team Members ● How to Be a Good HAZOP Participant ● HAZOP Meeting ● HAZOP Recording*
0800 – 0930	***Process HAZOP*** *Prerequisites ● HAZOP Procedure ● Modes of Operation ● Process HAZOP Worksheet ● Worksheet Entries*
0930 – 0945	*Break*
0945 – 1100	***Process Parameters*** *Examples of Process Parameters ● Guidewords ● Additional Guidewords ● Guideword + Parameter*
1100 – 1200	***Procedure HAZOP*** *What is a Procedure HAZOP? ● Procedure ● Guidewords ● Alternative Guidewords*
1200 – 1230	***Reporting & Review*** *Report Contents ● Review Meetings*
1230 – 1245	*Break*
1245 – 1300	***Conclusions*** *HAZOP Results ● Advantages ● Success Factors ● Pitfalls and Objections*
1300 – 1315	***Course Conclusion*** *Using this Course Overview, the Instructors will Brief Participants about the Course Topics that were Covered During the Course*
1315 – 1415	***COMPETENCY EXAM***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & 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 Haward "Haward PHA/HAZOP" Simulator.



Haward PHA/HAZOP Simulator

Course Coordinator

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