

COURSE OVERVIEW PE0064

**Asset Operational Integrity for Operations - Advanced
(E-Learning Module)**

Course Title

Asset Operational Integrity for Operations - Advanced (E-Learning Module)

Course Reference

PE0064

Course Format & Compatibility

SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)



Course Duration

30 online contact hours
(3.0 CEUs/30 PDHs)



Course Description



This E-Learning course is designed to provide participants with an advanced overview of asset operational integrity for operations. It covers the main hazards, consequences and control measures in gas processing, transportation and distribution facilities; the industry-specific impacts and management; the risk in normal operations and emergency conditions, LNG spill, risk-based, risk-driven, risk-based funding and resource allocation; the risk measurement, risk communication, strategic planning, risk assessment and effective public and private sector risk management practices; and the hazard identification, hazard analysis and risk assessment.



During this interactive course, participants will learn the EMAP standard, risk-based planning and social vulnerability; the failures, criticality and safety critical elements including the major accident hazards and identification of SCE; the QRA methods, risk management and standard operating procedures; the instrumented protective systems (IPS) and emergency shutdown (ESD)/emergency depressurization (EDP); the fire & gas system functions and root cause analysis; and the asset integrity management (AIM) and the associated agents in the oil and gas industry and operational integrity.



Course Objectives

At the end of this course, the Trainee will be able to:-

- Apply and gain an advanced knowledge on asset operational integrity for operations
- Explain the main hazards, their consequences and control measures in gas processing, transportation and distribution facilities
- Explain the risk in normal operations and emergency conditions
- Define the concept of major failures and explain the process to identify criticality and safety critical elements
- Conduct HAZID, HAZOP, safety critical equipment and QRA to identify and assess risk of gas operations
- Understand residual risk of operation and the mitigation controls related to the operation of plant and facilities
- Explain the purpose of risk registers
- Explain the importance of standard operating procedures (SOPs) and variable table in gas operations
- Explain the importance of Instrumented Protective Systems (IPS) and describe its function
- Define safety integrity level and its significance to plant safety
- Explain the working of High Integrity protection System (HIPS)
- Describe the working of fire & gas system
- Describe the actions during the activation of different levels of ESD
- Explain the alarm management philosophy of own facility
- Participate in root cause analysis to determine the root cause of failures and to prevent reoccurrence
- Explain the purpose of operational integrity registers (override, locked valve, passing valve, temporary repair, temporary equipment and hose registers), operating procedures, operating manuals and safety procedures in gas operations
- Explain the importance of inspection and test in asset integrity management
- Describe the different types of corrosion mechanisms
- Describe the corrosion control methods as applicable to gas processing, transportation and distribution facilities
- Explain the role of operating personnel in maintaining asset / operational integrity
- Identify the main hazards, consequences and control measures in gas processing, transportation and distribution facilities

- Discuss the industry-specific impacts and management covering environment, hazardous materials management, spills, wastewater discharges, cooling water and cold-water streams, other wastewater streams, drainage and storm waters, etc
- Identify the risk in normal operations and emergency conditions, LNG spill, risk-based, risk-driven, risk-based funding and resource allocation
- Apply measuring risk, risk communication, strategic planning, risk assessment and effective public and private sector risk management practices
- Employ hazard identification, hazard analysis and risk assessment as well as discuss EMAP standard, risk-based planning and social vulnerability
- Recognize the failures, criticality and safety critical elements including the major accident hazards and identification of SCE
- Employ QRA methods, risk management and standard operating procedures
- Determine instrumented protective systems (IPS) and emergency shutdown (ESD)/emergency depressurization (EDP)
- Recognize fire & gas system functions and carryout root cause analysis
- Apply asset integrity management (AIM) and explain the current trends for AIM including the corrosion types, the associated agents in the oil and gas industry and operational integrity

Who Should Attend

This course provides an overview of all significant aspects and considerations of asset operational integrity for operations for managers, engineers, inspectors and technicians in the fields of integrity & inspection, engineering, maintenance, process & operations, HSE from heavy industry but especially oil & gas, petrochemical & chemical, refineries, power & utilities and engineering.

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test


Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

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USA International Association for Continuing Education and Training (IACET)

Haward Technology is an Authorized Training Provider by the International Association 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 1-2013 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 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 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.

Course Fee

As per proposal

Course Contents

- The Main Hazards, Consequences and Control Measures in Gas Processing, Transportation and Distribution Facilities
- Introduction
- Industry-Specific Impacts and Management
- Environment
- Hazardous Materials Management
- Spills
- Wastewater Discharges
- Other Wastewater Streams
- Air Emissions
- Exhaust Gases
- Venting and Flaring
- Boil-Off Gas
- Fugitive Emissions
- Waste Management
- Noise
- LNG Transport
- LNG Fueling
- Occupational Health and Safety
- Fires and Explosions
- Roll-over
- Contact with Cold Surfaces
- Chemical Hazards
- Confined Spaces
- Community Health and Safety
- Security
- Case Study #1
- Quiz #1
- Risk in Normal Operations and Emergency Conditions
- LNG Spill
- Risk-Based
- Objectives
- Scope

- Readings
- Define “Risk-Driven”
- Effective Risk Management
- Risk-Driven
- How Do Emergency Managers Address Risk?
- Risk-Based Funding and Resource Allocation
- Measuring Risk
- Risk Communication
- Strategic Planning
- Risk Assessment
- Effective Public and Private Sector Risk Management Practices
- Better Risk Management
- Hazard Identification
- Hazard Analysis
- Risk Assessment
- Risk Matrix
- EMAP Standard
- Risk-Based Planning
- Social Vulnerability
- Case Study #2
- Quiz #2
- Failures, Criticality and Safety Critical Elements
- Failure
- Defining Failure
- High & Low Powered Accidents
- The Engineering Challenge
- Major Accident Hazards and Identification of SCE
- Major Accident Hazards
- Identification of Safety Critical Elements (SCE)
- The Challenges
- The Solution
- Benefits
- Case Study #3
- Quiz #3

- HAZID, HAZOP, Safety Critical Equipment and QRA to Identify and Assess Risk of Gas Operations
- Introduction
- QRA Methods
- Process Description
- Risk Assessment Methods
- Table-1: Equipment and Component List
- Hazard Identification
- HAZOP Study
- Frequency Estimation
- Consequence Analysis
- Jet Fire
- Pool Fire
- Flash Fire
- Vapor Cloud Explosions
- Toxic Gas Dispersion
- Results and Discussion
- Conclusions
- Case Study #4
- Quiz #4
- Residual Risk, Mitigation Controls & Risk Registers
- The Fundamentals of Risk Management
- The Need for Risk Management
- The Risk Management Cycle
- Typical Risk Management Stages
- Identify
- Understand and Evaluate
- Assess
- Select
- Implement
- Monitor and Review
- Communicate
- Implementing the Risk Management Stage
- Applying the 'Rule-Based' Approach
- Case Study #5

- Quiz #5
- Standard Operating Procedures – SOP's
- Introduction
- Overview
- Purpose
- Benefits
- Case study #6
- Quiz #6
- Instrumented Protective Systems (IPS)
- Introduction
- Purpose
- Case study #7
- Quiz #7
- Levels of ESD and Fire & Gas System
- Emergency Shutdown (ESD) / Emergency Depressurization (EDP)
- Fire & Gas System
- Fire & Gas System Functions
- Case study #8
- Quiz #8
- Root Cause Analysis
- Root Cause Analysis Defined
- RCA Helps Pinpoint Contributing Factors to a Problem or Event
- Goals
- Benefits
- Principles
- Roots
- Applying RCA
- Basic Method to Use
- RCA Methods
- Case Study #9
- Quiz #9
- Importance of Inspection and Test in Asset Integrity Management & Corrosion
- AIM – Asset Integrity Management
- Application of Asset Integrity Management

- Current Trends for AIM
- Corrosion
- Introduction
- Corrosion Types and Associated Agents in the Oil and Gas Industry
- Case Study #10
- Quiz #10
- Operating personnel
- The Systems: People, Process and Assets
- People
- Assets
- Process
- What does this mean?
- Case study #11
- Quiz #11