COURSE OVERVIEW PE0063

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

Course Title

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

Course Reference

PE0063

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 is designed to provide participants with a detailed and up-to-date overview of intermediate asset operational integrity for operations. It covers the hazards in gas processing, transportation and distribution facilities; the environmental impacts and the threats to aquatic and shoreline environments; the marine environmental impacts, colonization of subsea structures, hazardous materials management, air emissions, waste management, noise and LNG transport; the safety and security considerations as well as the risk in normal operations and emergency conditions; and the effective risk management, risk-based funding and resource allocation, measuring risk, risk communication, strategic planning, risk assessment, hazard identification and hazard analysis.

During this interactive course, participants will learn the risk matrix, EMAP standard, risk-based planning and social vulnerability; the QRA methods, ALARP descriptions and demonstration and the safe operating limits and its importance; teh maintenance technologies, preventive and predictive maintenance, proactive maintenance, self-maintenance and shift from reactive and preventive maintenance to predictive maintenance; and the standard operating procedures and discuss instrumented protective systems (IPS) and emergency shutdown (ESD)/emergency depressurization (EDP).

Course Objectives

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

- Apply and gain a good working knowledge on asset operational integrity for operations
- Identify the main hazards in gas processing, transportation and distribution facilities
- Explain the risk in normal operations and emergency conditions
- Apply knowledge of HAZID, HAZOP, Safety Critical Equipment and QRA to identify and assess risk of gas operations
- Explain how barriers and controls are used to minimize the risks to the ALARP level in gas operations
- List the important normal operating parameters of own facility
- Identify situations when the process parameters exceed safe operating limits
- Explain control room operator actions when parameters exceed safe operating limits
- Describe what is meant by proactive monitoring of plant and facilities
- Provide examples of proactive monitoring through control panel
- Explain the importance of Standard Operating Procedures (SOPs) and variable table in gas operations
- Explain the philosophy behind stabilise, slowdown, shutdown
- Explain the importance of Instrumented Protective Systems (IPS) and describe its function
- Explain the working of High Integrity protection System (HIPS)
- Explain the levels and working of ESD system
- Describe the function of Fire & Gas System
- Describe the actions to manage alarms and alerts from the DCS
- Explain how to verify the accuracy of alarms and how to segregate spurious / unwanted / bad actor alarms
- Define corrosion and list out the different types of corrosion in gas processing, transportation and distribution facilities
- Explain the consequences of corrosion in gas operations
- Explain the role of operating personnel in maintaining asset /operational integrity
- Identify the hazards in gas processing, transportation and distribution facilities
- Discuss the environmental impacts and the threats to aquatic and shoreline environments
- Explain marine environmental impacts, colonization of subsea structures, hazardous materials management, air emissions, waste management, noise and LNG transport

- Apply safety and security considerations as well as identify the risk in normal operations and emergency conditions
- Carryout effective risk management, risk-based funding and resource allocation, measuring risk, risk communication, strategic planning, risk assessment, hazard identification and hazard analysis
- Discuss risk matrix, EMAP standard, risk-based planning and social vulnerability
- Employ QRA methods, ALARP descriptions and demonstration and the safe operating limits and its importance
- Review survey results as well as employ maintenance technologies, preventive and predictive maintenance, proactive maintenance, self-maintenance and shift from reactive and preventive maintenance to predictive maintenance
- Recognize the benefits of predictive maintenance including predictive maintenance methodologies
- Implement the standard operating procedures and discuss instrumented protective systems (IPS) and emergency shutdown (ESD)/emergency depressurization (EDP)
- Recognize fire and gas system, corrosion types and 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 facility integrity engineers, inspection engineers, corrosion engineers, facility engineers, reliability engineers, design engineers, maintenance engineers, safety engineers, loss prevention engineers, managerial personnel and section heads and those engaged in the development and implementation of mechanical integrity programs for critical process equipment.

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: -

- 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.

- 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

- Hazards in gas processing, transportation and distribution facilities
- Introduction
- Environmental Impacts
- Safety
- Security Considerations
- Case study #1
- Quiz #1
- The risk in normal operations and emergency conditions
- Risk-Based
- Scope
- Readings
- Define “risk-driven”
- Effective risk management is based upon
- 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

- HAZID, HAZOP, Safety Critical Equipment and QRA to identify and assess risk of gas operations
- Introduction
- QRA Methods
- Process Description
- Natural Gas Compression and Associated Pipeline Network System
- Risk assessment methods
- Typical Risk Assessment Flow Diagram
- Equipment and component list
- Hazard identification
- Hazard Section with Guide Words
- HAZOP study
- Frequency estimation
- Leak Frequency Distribution Based on Hole Size
- Consequence analysis
- Event Tree Analysis Showing the Various Outcome Cases of Natural Gas Leakage
- Jet fire
- Pool fire
- Flash fire
- Vapour Cloud Explosions
- Toxic Gas Dispersion
- Results And Discussion
- Risk Contour of Natural Gas Gathering Station and Associated Pipeline Network
- Location Specific Individual Risk
- Conclusions
- Case study #3
- Quiz #3
- Barriers and controls used to minimize the risks to the ALARP level in gas operations
- ALARP descriptions and demonstration
- Formal safety assessment ALARP description
- Types of Barriers and Supporting SMS Elements
- Risk-related Decision Making Framework
- Intolerable risk

- Tolerable if ALARP risk
- Broadly acceptable risk
- Determination of Risk Assessment Method Based on Risk Tolerance
- What more could be done to reduce the risks?
- Why has this not been done?
- Case study #4
- Quiz #4
- Important normal operating parameters of own facility
- Notation
- What are Safe Operating Limits and Why Are they Important
- Safe Operating Limits
- Survey Results
- Operational Limits
- Types of Operational Limits that are Defined
- Key Information for Establishing Safe Operating Limits
- Important Information for Establishing Safe Operating Limits
- Storing Official Record of Safe Operating Limits
- Storage Location for Safe Operating Limits
- Periodic Review of Safe Operating Limits
- Use of Process History to Validate Safe Operating Limits
- Actions Taken When a Safe Operating Limit is exceeded
- Operator Training and Awareness of Safe Operating Limits
- Defining Alarms to Indicate SOL Exceedances
- Recording SOL Exceedances
- How are Safe Operating Limits Determined
- Case study #5
- Quiz #5
- Proactive monitoring of plant and facilities
- Maintenance Technologies Overview
- The development of maintenance technologies
- No Maintenance
- Reactive Maintenance
- Preventive maintenance

- Minor PM
- Major PM
- Predictive maintenance (PdM)
- Proactive maintenance
- Self-Maintenance
- Where Are We Now?
- Shift From Reactive and Preventive Maintenance to Predictive Maintenance
- The Benefits of Predictive Maintenance
- Requirements for Predictive Maintenance
- Predictive Maintenance Methodologies
- Condition-Based Monitoring and Performance Assessment
- Conclusion
- Case study #6
- Quiz #6
- Standard Operating Procedures – SOP's
- Introduction – Overview
- Purpose
- Benefits
- Case study #7
- Quiz #7
- Instrumented Protective Systems (IPS)
- Introduction
- Purpose
- Case study #8
- Quiz #8
- Levels of ESD and Fire & Gas System
- Emergency Shutdown (ESD) / Emergency Depressurization (EDP)
- Fire & Gas System
- Understanding Fire and Gas Systems
- Fire & Gas System Functions
- Case study #9
- Quiz #9
- Corrosion

- Corrosion types and associated agents in the oil and gas industry
- Case study #10
- Quiz #10
- Operating personnel
- Operational Integrity
- The Systems: People, Process and Assets
- The three aspects are heavily interdependent, requiring a thorough understanding of how they combine together
- People
- Assets
- Process
- What does this mean?
- Case study #11
- Quiz #11