Global Horizon
TRAINING CENTER

Training Course:
Process and Plant Safety

1 - 5 November 2026
Istanbul (Turkey)
DoubleTree by Hilton Istanbul Esentepe

Training Course:
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Training Course code: HE234796 From: 1 - 5 November 2026 Venue: Istanbul (Turkey) - DoubleTree by Hilton Istanbul Esentepe Training Course Fees: 6300 Euro

Introduction

The production of the process industry often involves hazards. Their nature can be both physical and chemical. Physical hazards derive from operating conditions that may be extreme, such as very low or very high temperatures and pressures. Chemical hazards are those associated with the materials present in the process, which can be toxic, flammable, exposable, or release energy due to spontaneous reactions. Indeed, it is necessary to put the substances into a reactive state in order to enable one to produce the desired products that may lead to hazards.

This comprehensive training course will provide an overview of each of the process safety management elements in the plant. Facilitators will also share best practices for implementing and managing each of these elements. The course is organized into 5 modules, each module will shed the light on the safety process that will be involved in the design of plants.

objectives

Learn how to identify process safety and major accident hazards in your facilities, and how to assess their risks and define critical controls barriers

- Understand the concepts of static and dynamic barrier management, and how barrier management can be used to analyze process safety and root cause incident investigation.
- Get hands-on experience with the development of bowtie diagrams
- Learn the characteristics of different types of barriers: hardware plant, human people, and organizational process
- Understand how a PSM system can help manage process safety risks, by providing governance and structure in terms of:
    - Showing commitment of the organization to process safety
    - Understanding hazards and their associated risk
    - Managing risk in operations, maintenance, and when new projects are initiated, and
    - Learning from incidents.
- Get a detailed overview of the expectations and good-industry practices.

Target Audience

- Plant or unit managers
- Head of sections or departments:
    - Operations.
    - Maintenance inspection.
    - Engineering
- Senior engineers :
    - Reliability.
    - Inspection.

Course Outline

Day 1: Commit to Process Safety

- Process Safety Culture: Establishing a culture focused on safety throughout operations.
- Compliance with Standards: Understanding and adhering to industry safety standards.
- Process Safety Competency: Developing the necessary skills and knowledge for managing process safety.
- Hazardous Properties of Materials: Identifying and managing risks associated with materials.
- Exothermic and Pressure-Generating Reactions: Managing reactions that release heat or generate pressure.
- Formal Kinetics Description of Chemical Reactions: Understanding chemical reaction kinetics for safety.
- Reactor Models: Exploring reactor models to identify safety risks.
- Autocatalytic Reactions: Managing self-accelerating reactions.
- Polymerization: Safety considerations for polymerization processes.
- Extreme Process Conditions: Managing high-risk extreme conditions.
- Endothermic Processes: Addressing safety in heat-absorbing processes.

Day 2: Understand Hazards and Risk

- Process Knowledge Management: Ensuring effective management of process safety knowledge.
- Hazard Identification and Risk Analysis: Techniques for identifying hazards and assessing risk.
- Manage Risk: Strategies to minimize and mitigate identified risks.
- Operating Procedures: Developing and enforcing safe operating procedures.
- Safe Work Practices: Implementing safe work practices across operations.
- Asset Integrity and Reliability: Maintaining the integrity and reliability of assets.
- Contractor Management: Ensuring contractors adhere to safety protocols.
- Training and Performance Assurance: Ensuring safety competence through training.
- Management of Change: Managing changes without compromising safety.
- Operational Readiness: Preparing operations for safe execution.
- Conduct Operations: Implementing safe practices in daily operations.
- Emergency Management: Developing and applying emergency response protocols.

Day 3: Safe Design and Operation of Plants

- Procedure for Ensuring Safety in Planning, Building, and Operating Plants: Establishing safety at every

stage of plant development and operation.
- Principles of Plant Safety and Fundamental Concepts: Core principles for safe plant operation.
- External Events: Preparing for and managing external risks.
- Plant Layout and Spacing: Designing safe layouts and spacing for equipment.
- Fire and Explosion Protection: Strategies for preventing and managing fire and explosion risks.
- Personal Safety and PPE: Ensuring personal protection through equipment and procedures.
- Safe Design and Procurement of Apparatuses: Selecting and ensuring the safety of equipment.
- Apparatuses, Machinery, and Tools: Ensuring safe use and maintenance of equipment.
- Hazard Assessment: Assessing plant hazards and mitigating risks.
- Safe Handling of Chemical Substances: Managing chemical hazards safely.
- Work with Special Hazards: Permit-to-Work System: Implementing controls for high-risk activities.
- Safety of Process Plants by Process Control: Using process control to ensure safety.
- Control System Characteristics and P&I Diagrams: Understanding control systems for safe operations.
- Programmable Electronic Systems: Integrating safety into programmable control systems.
- Integration of PCE in the Safety Concept: Ensuring process control systems are part of the safety plan.
- Case Study: Iron-Catalyzed Oxidation of Ethanol with Hydrogen Peroxide - risk assessment in practice.
- Protection of Equipment End-of-pipe Technology: Using protective devices for safety.
- Safety Valves and Bursting Disc Protection Device: Managing safety valves and protection devices.
- Combination of Safety Valve and Bursting Disc Protection: Enhancing protection using combined safety measures.
- Dimensioning of Relief Devices: Correct sizing of relief devices for safety.
- Constructive Measures of Explosion Protection: Implementing safety measures to prevent explosions.

Day 4: Risk

- Overview of Risk and Safety Analyses: Introduction to risk analysis methodologies.
- Risk Limits: Understanding acceptable risk levels.
- Representation of Risks: Visualizing and communicating risk data.
- Investigation of Engineered Plant Systems: Assessing the reliability of plant systems.
- Mathematical Description of Engineered Systems: Quantifying system reliability.
- Reliability Data for Engineered Components: Using data to predict system reliability.
- Fault Tree Analysis FTA: Applying Boolean variables and FTA to evaluate plant risks.
- Increasing Survival Probability and Availability: Methods to improve system reliability.
- Dependent Failures: Understanding how failures can influence other systems.
- Human Error: Addressing human factors in risk analysis.
- Case Studies for Fault Tree Analysis: Practical application of FTA in real-world scenarios.

Day 5: Consequences of Accidents

- Failure of Containment: Managing containment breaches and their consequences.
- Emission from Leaks: Addressing risks from hazardous leaks.
- Pool Formation and Vaporization: Managing liquid pooling and vapor risks.
- Atmospheric Dispersion: Controlling the dispersion of hazardous materials in the air.
- Fires and Explosions: Assessing and preventing fire and explosion risks.
- BLEVE Boiling Liquid Expanding Vapor Explosion: Understanding and preventing BLEVE events.
- Dust Explosion: Managing risks related to dust explosions.
- Flight of Missiles: Protecting against risks from projectiles.
- Risk Assessment for Natural Gas High-Pressure Pipeline Failure: Practical application of risk assessment techniques.
- Functional Safety Safety Integrity Levels: Ensuring systems meet required safety integrity levels.
- Determining Safety Distances: Calculating safe distances for operations.
- Risk-Based Approach: Using a risk-based method for safety management.

- Processing of Random Variables: Managing uncertainty in risk assessments.
- Risk Limits and Distances: Using risk considerations to determine safe distances.
- Deterministic Procedures in Germany KAS Guidelines: Safety guidelines for plant operations in Germany.

Registration form on the Training Course: Process and Plant Safety

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