Oil and Gas Process Safety and Risk Management Training Course

21 - 25 Dec 2026

Munich

5100 € (Per Person)

Ref: #OG3365_99954

Course Introduction / Overview:

The oil and gas industry operates at the frontier of high-risk environments, where a minor oversight can lead to catastrophic consequences. This makes Process Safety Management (PSM) not just a regulatory requirement but a fundamental pillar of operational excellence and corporate responsibility. This intensive training course provides a comprehensive exploration of the principles and practices essential for managing process-related risks effectively. Drawing on the foundational work of process safety pioneers like Trevor Kletz, whose book "What Went Wrong?" remains a critical text, the curriculum delves into both the technical and cultural aspects of safety. Participants will move beyond theoretical knowledge to gain practical skills in hazard identification, risk assessment, and incident investigation. BIG BEN Training Center has designed this program to equip professionals with the expertise to implement and sustain robust safety systems, ensuring the protection of people, assets, and the environment. This course is an indispensable journey into the core of process safety, transforming understanding into actionable competence for preventing major accidents in the hydrocarbon industry.

Target Audience / This training course is suitable for:

- Process Safety Engineers and Specialists.
- Operations Managers and Supervisors.
- HSE (Health, Safety, and Environment) Managers and Advisors.
- Plant and Facility Managers.
- Project and Engineering Managers.
- Maintenance and Reliability Engineers.
- Risk Management Professionals.
- Technical Safety Professionals.
- Incident Investigators and Team Leaders.
- Regulatory Compliance Officers.

Target Sectors and Industries:

- Upstream Oil and Gas (Exploration and Production).
- Midstream Oil and Gas (Transportation and Storage).
- Downstream Oil and Gas (Refining and Processing).
- Petrochemical and Chemical Manufacturing Plants.
- Liquefied Natural Gas (LNG) Facilities.
- Offshore and Onshore Drilling Operations.
- Engineering, Procurement, and Construction (EPC) Companies.
- Governmental Regulatory Agencies and Bodies.

Target Organizations Departments:

- Health, Safety, and Environment (HSE) Department.
- Operations and Production Department.
- Engineering and Design Department.
- Maintenance and Asset Integrity Department.
- Project Management Department.
- Risk Management and Assurance Department.
- Process Engineering Department.
- Emergency Response and Crisis Management Teams.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop and implement the 14 key elements of a Process Safety Management (PSM) system.
- Lead and participate effectively in Process Hazard Analysis (PHA) studies using HAZOP and What-If methodologies.
- Apply risk assessment techniques, including risk matrices and Layer of Protection Analysis (LOPA).
- Understand the fundamentals of Safety Integrity Level (SIL) determination and verification.
- Master the Management of Change (MOC) process to ensure new risks are not introduced.
- Conduct thorough incident investigations using root cause analysis (RCA) techniques.
- Develop and evaluate emergency response and preparedness plans.
- Audit and assess the effectiveness of an existing PSM program for continuous improvement.
- Integrate human factors into process safety design and procedures.
- Champion a proactive and positive safety culture within their organization.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, interactive, and highly practical, ensuring that participants can directly apply their learning to real-world scenarios. This course moves beyond traditional lectures by incorporating a dynamic blend of training techniques. A cornerstone of the program is the extensive use of detailed case studies from the oil and gas industry, analyzing major incidents to extract critical lessons on prevention and mitigation. Participants will engage in collaborative group workshops where they will conduct mock Process Hazard Analysis (PHA) and HAZOP sessions, allowing them to practice these vital techniques in a controlled environment. Interactive discussions, problem-solving exercises, and syndicate work foster a rich learning atmosphere where diverse professional experiences are shared and debated. The training sessions are facilitated by experienced industry experts who provide continuous feedback and guide participants through complex concepts. This hands-on, participant-centered approach ensures a deep and lasting understanding of process safety principles and their practical implementation.

Course Agenda (Course Units):

Unit One: Fundamentals of Process Safety Management (PSM)

- Introduction to Process Safety in the Oil and Gas Industry.
- Distinguishing Between Process Safety and Personal Safety.
- History and Evolution of PSM Regulations (e.g., OSHA 1910.119).
- The 14 Elements of a Process Safety Management System.
- Understanding Major Accident Hazards (MAHs).
- The Role of Leadership and Management Commitment.
- Developing and Fostering a Proactive Safety Culture.

Unit Two: Hazard Identification and Analysis

- Process Hazard Analysis (PHA) Methodologies Overview.
- Hazard and Operability (HAZOP) Study Principles and Application.
- Conducting a What-If and Checklist Analysis.
- Failure Mode and Effects Analysis (FMEA) for Equipment Reliability.
- Consequence Modeling for Fire, Explosion, and Toxic Release.
- Identifying and Managing Human Factors in Hazard Scenarios.
- Practical Workshop on Leading a PHA/HAZOP Session.

Unit Three: Consequence and Risk Assessment

- Principles of Risk Assessment and Management.
- Developing and Using Risk Matrices.
- Introduction to Quantitative Risk Assessment (QRA).
- Layer of Protection Analysis (LOPA) Methodology.
- Determining Safety Integrity Levels (SIL) for Safety Instrumented Functions.
- Understanding the Concept of As Low As Reasonably Practicable (ALARP).
- Bowtie Analysis for Visualizing and Managing Risks.

Unit Four: Managing Assets and Operational Integrity

- The Critical Role of Mechanical Integrity Programs.
- Developing and Implementing Safe Operating Procedures.
- Management of Change (MOC) and Its Critical Importance.
- Pre-Startup Safety Review (PSSR) Requirements.
- Contractor Safety Management and Oversight.
- Asset Integrity Management and Inspection Regimes.
- Permit-to-Work Systems and Energy Isolation.

Unit Five: Learning from Experience and Continuous Improvement

- Incident Investigation and Root Cause Analysis (RCA) Techniques.
- Emergency Planning and Response Procedures.
- Conducting Effective PSM Audits and Assessments.
- Measuring Performance with Leading and Lagging Indicators.
- Management Review and Continuous Improvement Cycles.
- Employee Participation and Engagement in PSM.
- Final Course Review and Action Planning Workshop.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Beyond regulatory compliance, how can an organization embed a proactive safety culture so deeply that it becomes an intrinsic value for every employee, from the boardroom to the frontline?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by adopting a holistic and deeply analytical approach to process safety, moving far beyond a simple review of regulatory checklists. Its core strength lies in its emphasis on the interconnectedness of technology, systems, and human factors. While other courses may focus narrowly on specific tools, this program integrates methodologies like HAZOP, LOPA, and Bowtie analysis into a broader strategic framework of risk management. A significant unique quality is the extensive use of forensic case study analysis of major industry incidents, which provides unparalleled insight into the complex chain of events leading to failure and, more importantly, the critical preventative measures. The curriculum is designed not just to teach procedures but to cultivate a mindset of chronic unease and proactive inquiry. It places a strong emphasis on developing leadership skills for championing safety culture, an element often neglected in purely technical training. By blending rigorous technical instruction with strategic thinking on human behavior and organizational culture, the course equips participants with a comprehensive and resilient understanding of process safety.