

Course No. 1649

Process Safety Management (PSM) in Oil & Gas Training Course

**PROCESS SAFETY MANAGEMENT
OIL & GAS**

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Process Safety Management (PSM) in Oil & Gas Training Course provides a comprehensive and practical framework for managing major accident hazards, preventing loss of containment, and strengthening process safety performance across oil and gas operations. The course focuses on the systematic identification, assessment, control, and continuous management of process safety risks associated with hydrocarbons, hazardous chemicals, high-pressure systems, complex processing facilities, and critical operating activities.

Process safety management is fundamentally different from conventional occupational safety. While personal safety focuses primarily on preventing individual injuries, process safety addresses the integrity of systems, processes, equipment, procedures, and organizational controls that prevent catastrophic events such as fires, explosions, toxic releases, and major hydrocarbon incidents. This course develops the ability to recognize process safety threats before they escalate and to establish effective barriers and controls throughout the asset lifecycle.

The program is designed specifically for the operational realities of the oil and gas industry, including upstream, midstream, downstream, refining, petrochemical, gas processing, storage, terminals, pipelines, and supporting facilities. Participants will explore key PSM elements such as process safety information, process hazard analysis, operating procedures, mechanical integrity, management of change, permit-to-work systems, pre-startup safety reviews, contractor management, emergency preparedness, incident investigation, and process safety performance measurement.

A strong emphasis is placed on practical risk control and operational decision-making. Participants will examine how failures in equipment integrity, procedures, human factors, competency, communication, maintenance, or change management can interact and create major accident scenarios. Through practical exercises and case-based activities, the course connects technical process safety requirements with management systems, operational discipline, and organizational accountability.

By the end of the Process Safety Management (PSM) in Oil & Gas Training Course, participants will be better equipped to identify weaknesses in process safety systems, evaluate the effectiveness of critical safeguards, strengthen operational controls, and support continuous improvement. The course provides a structured approach that can help organizations improve process safety

governance, reduce major accident potential, protect people and assets, and strengthen the reliability and resilience of oil and gas operations.

Objectives

- Analyze the fundamental principles of Process Safety Management and distinguish process safety risks from conventional occupational safety risks within oil and gas operations.
- Assess major accident hazards associated with hydrocarbons, hazardous substances, high-pressure systems, process units, storage facilities, pipelines, and critical operating activities.
- Develop practical approaches for managing process safety information, operating procedures, equipment data, chemical information, and critical process documentation.
- Apply structured process hazard analysis techniques to identify credible accident scenarios, initiating events, consequences, safeguards, and risk controls.
- Evaluate the effectiveness of critical process safety barriers and identify weaknesses that could contribute to loss of containment or major accident events.
- Strengthen mechanical integrity practices covering inspection, testing, maintenance, reliability, critical equipment, and safety-critical elements.
- Apply Management of Change principles to evaluate the process safety implications of technical, operational, organizational, and procedural changes.
- Assess the effectiveness of permit-to-work, isolation, lockout and tagout, hot work, confined space, and simultaneous operations controls.
- Improve contractor and operational workforce management by strengthening competency, communication, supervision, and process safety responsibilities.
- Evaluate process safety incidents and near misses using structured investigation methodologies to identify underlying and systemic causes.
- Design practical process safety performance indicators that distinguish leading indicators from lagging indicators and support proactive risk management.
- Develop a practical PSM improvement action plan addressing identified gaps in process safety governance, operational control, asset integrity, and major accident prevention by the end of the course.

Who Should Attend

This training course is designed for professionals responsible for process safety, operational safety, asset integrity, production, engineering, maintenance, inspection, reliability, HSE, risk management, emergency response, and operational excellence within the oil and gas industry. It is particularly relevant to process safety engineers, HSE managers and specialists, production managers, operations managers, maintenance managers, reliability engineers, mechanical integrity professionals, inspection engineers, process engineers, facility engineers, technical safety professionals, and emergency response personnel.

The course is also highly suitable for senior managers, asset managers, plant managers, engineering managers, project managers, operations leaders, and executives responsible for the safe and reliable operation of oil and gas assets. Professionals involved in refining, petrochemical processing, gas treatment, offshore and onshore production, terminals, pipelines, storage, utilities, and major capital projects will benefit from its practical focus on process safety governance and risk control.

It is also valuable for personnel involved in technical assurance, project engineering, commissioning, procurement, contractor management, internal auditing, compliance, risk assessment, and management systems. The course is structured to support both technical specialists who manage process safety risks directly and decision makers who are accountable for maintaining effective organizational controls and operational resilience.

Learning Outcomes

- Identify major process safety hazards and distinguish them from personal occupational safety hazards in oil and gas facilities.
- Assess credible major accident scenarios involving fire, explosion, toxic exposure, loss of containment, and hazardous energy release.
- Review and organize process safety information required to support safe operation, maintenance, engineering, and risk assessment.
- Apply process hazard analysis principles to evaluate hazards, initiating events, consequences, safeguards, and risk reduction measures.
- Evaluate safety-critical barriers and determine whether existing controls are capable of preventing or mitigating major accident scenarios.

- Assess mechanical integrity arrangements for pressure equipment, pipelines, storage systems, rotating equipment, instrumentation, and other safety-critical assets.
- Apply Management of Change processes to identify and control risks arising from modifications to equipment, processes, technology, procedures, and organizational arrangements.
- Evaluate permit-to-work and energy isolation practices and identify opportunities to strengthen control of high-risk maintenance and operating activities.
- Analyze process safety incidents, near misses, and loss-of-containment events to identify immediate, underlying, and systemic causes.
- Develop meaningful leading and lagging process safety indicators for monitoring organizational performance and control effectiveness.
- Evaluate contractor management and workforce competency arrangements from a process safety perspective.
- Prepare a practical process safety improvement plan that prioritizes actions according to risk, operational significance, and organizational capability.

Course Outline

DAY 01

Foundations of Process Safety Management in Oil & Gas

- Principles, objectives, and business importance of Process Safety Management in oil and gas operations
- Difference between occupational safety, process safety, asset integrity, and major accident prevention
- Major accident hazards in upstream, midstream, downstream, refining, gas processing, storage, and transportation operations
- Process safety culture, operational discipline, leadership accountability, and organizational responsibility

PRACTICAL APPLICATION

Analyze a major oil and gas process safety incident and identify failed controls, contributing factors, critical barriers, and opportunities for prevention

DAY 02

Process Safety Information, Hazard Analysis & Risk Assessment

- Process safety information and its role in safe design, operation, maintenance, and modification
- Process Hazard Analysis and structured identification of hazardous scenarios
- Hazard and Operability Study principles and practical application
- Layers of protection, safety barriers, risk reduction, and prevention versus mitigation controls

PRACTICAL APPLICATION

Conduct a scenario-based process hazard analysis for an oil and gas process unit and evaluate existing safeguards

DAY 03

Operational Integrity, Mechanical Integrity & Management of Change

- Safe operating procedures, operating limits, startup, shutdown, abnormal operations, and operational discipline
- Mechanical integrity management for pressure equipment, piping, valves, rotating equipment, instrumentation, and safety systems
- Inspection, testing, preventive maintenance, reliability, and management of safety-critical equipment
- Management of Change for technical, process, equipment, organizational, and procedural modifications

PRACTICAL APPLICATION

Review a proposed plant modification and conduct a process safety change assessment covering hazards, safeguards, documentation, competency, and approval requirements

DAY 04

High-Risk Operations, Human Factors & Incident Management

- Permit-to-work systems, energy isolation, lockout and tagout, hot work, confined space, and line breaking controls
- Contractor management, competency assurance, supervision, communication, and control of simultaneous operations
- Human factors, fatigue, workload, communication, procedure use, and organizational influences on process safety
- Incident and near-miss investigation, root cause analysis, learning from failures, and corrective action management

PRACTICAL APPLICATION

Investigate a simulated loss-of-containment event and identify immediate causes, underlying causes, failed barriers, and corrective actions

DAY 05

Process Safety Performance, Emergency Preparedness & Continuous Improvement

- Process safety performance measurement using leading and lagging indicators
- Emergency preparedness, response planning, escalation, and coordination for major process safety events
- Process safety auditing, compliance assessment, management review, and identification of systemic weaknesses
- Process safety culture improvement, leadership engagement, lessons learned, and continuous improvement

FINAL WORKSHOP

Develop an integrated Process Safety Management improvement plan for an oil and gas organization, including priority risks, critical barriers, performance indicators, responsibilities, corrective actions, and implementation priorities



Register or Request More Information

Course page: <https://quest-training.com/courses/process-safety-management-psm-in-oil-gas-training-course>

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