



# Process Safety Management (PSM) Training

## Duration: 10 Days

### Introduction

This training course includes a wide range of subjects with many applications in Oil & Gas, Chemical and Process industries, related to hydrocarbons and chemical processing. This course provides an overview of important elements of process safety as they are often encountered in today's industrial practice. The emphasis is on engineering design aspects of Process Safety Management and it will highlight the safeguarding aspects of processing equipment inside the plant.

Techniques for analyzing and mitigating process safety hazards applicable to Oil & Gas processing will be reviewed. Integration of the concepts required to achieve an optimum approach to Process Safety Engineering is the main goal of this course. Exercises and useful examples will be utilized throughout the course to emphasize the key learning points.

### Upon completion of this course, the delegates will learn:

- PSM Elements
- Importance of the concept of "Inherently Safer Design"
- Design principles based on Codes and Standards for safe operation of process equipment
- Selection of methods and conducting risk assessments
- Common process hazards identification methods: HAZOP, LOPA, FMEA
- Detection and prevention methods for fire and explosion accidents
- Plant Equipment Inspection (NDT) and Maintenance Procedures

## Learning Outcomes

How to identify hazard and assess risk in the working environment related to production processes and design. Identify barriers in design and engineering to be in place to safeguard plant and processes. The course will ensure the following understanding:

- Comprehensive understanding of different aspects of process design that influence process safety
- Ability to select an “inherently safer design” for the entire process plant operation
- Knowledge on the mechanical structure integrity of process equipment
- Familiarity with hazards LOPA and when to apply the best PHA method and technique
- Experience with the requirements of CFR 1910, CCPS and PSM elements.
- Knowledge of how to operate safely during an emergency and co-ordinate emergency preparedness and response programmes.
- Employ the latest methodology on hazard identification with various types of process plant incidents, impact and approaches to systematic identification of hazards and risks.

## Target Audience

Process, operational and maintenance personnel

## Purpose

The overall purpose of this course is for learners to learn how to identify process hazards, determine major accident hazards, and eliminate/mitigate the risk of process safety hazards when specifying the design of oil field processing equipment and facilities. Participants will learn about inherently safer design, the design and operation of process safety systems, and devices, and develop operating procedures that take into account process safety.

## Content

- Process safety aspects of oil field production equipment and materials design specification and operations.
- HAZID/HIRAC in particular major accident hazards.
- Inherently safer design principles.
- Plant layout.
- Understanding hazard risk, use of risk assessment and risk management.
- Hazardous area classifications.
- Use of safety studies (SIL assessment, LOPA, QRA,)
- Identification of abnormal operational conditions.
- Process safety systems and devices.
- Principles of area classification and plant layout.
- Minimization of process safety risk.
- Quantitative process safety risk analysis.
- Conducting process safety management audits, operability reviews, and incident investigations.

Once participants return to the workplace they can be assessed in the following:

1. Knows how to minimize the risk of process safety hazards, applying ALARP – as low as reasonable practicable
2. The design and operation of process safety systems and devices.
3. How to perform process safety management audits and conduct incident investigations.
4. How to develop operating procedures that take into account process safety.

## Who Should Attend

- People who are making day to day decisions regarding operation, design, maintenance, and economics of process industry plants.
- Engineers, Operating Personnel, PSM Coordinator, HSE Managers and Engineers
- Ideal for veterans and those with only a few years of experience who want to review or broaden their understanding of process safety.
- Other professionals who desire a better understanding of the subject matter.
- Engineers and technicians in Oil & Gas, chemical and process industries
- Process, mechanical and chemical engineers
- Engineers and technicians who deal with reactors and piping systems
- Design engineers, project engineers and HSE managers
- Control, automation and instrumentation engineers
- Operators and maintenance personnel

## Training Methodology

The training will be conducted along workshop principles with formal lectures and interactive examples, which will result in the active participation of all delegates in discussions and teamwork. Real life examples will be selected to illustrate the efficient operation and potential technical failures as well as their root causes. The emphasis will be on troubleshooting the problems and maintaining plant safety. There will be ample opportunities for active, open discussion and sharing professional experiences on various safety issues. All course materials will be provided.

## Organisational Impact

On completion of this training, the delegate will be able to critically analyze the safety methodologies employed within the organization and instigate improvements where required.

## The knowledge gained in this training will:

- Enable the delegate to optimize the operation of various components of equipment while maintaining safety of the plant
- Give the delegate confidence to carry out risk minimization analyses on process equipment thereby avoiding failures
- Enable measures to enhance equipment status for the given operating conditions
- Give better handling of pressure relief system
- Enable better specification of new and replacement of old elements of piping system
- Allow tighter control of maintenance budgets by the avoidance of unplanned equipment failures in service
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## Personal Impact

- Improved confidence when considering safety issues
- Better understanding of how the process design impacts safety of the plant
- Better grasp of maintenance and instrumentation on incident prevention
- Improved personal knowledge of risk and hazard analysis
- Better ability to troubleshoot difficult and hazardous situations
- Confidence and ability to select the appropriate depressuring plan thereby improving reliability and personal profile to senior management

## Course Layout

- Module 1: Four days Foundation Process Safety. PSM CFR CCPS CSB
- Module 2: One day for Inherently Safer Design.
- Module 3: One day for Layer of Protection Analysis (LOPA).
- Module 4: Two days for Managing Process Safety Risks during Organizational Change. MOC
- Module 5: Two for recognizing catastrophic Incident Warning Signs.

## ISTEC Training Services

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ISTEC's Training Services offer organizations a comprehensive training portfolio for enriching their workforce.

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