

# Risk Assessment within Production Operations

## INTRODUCTION

- Major industrial disasters cause death, injury, financial loss, and damage to Company Reputation. They are to be avoided. Take this opportunity to learn from the mistakes that others have made!
- Health, Safety and Environmental Management Systems are based on a proactive process for incidents prevention as well as reactive monitoring of performance. Risk assessment is required to be applied to all activities that impact on Health & Safety, production, asset, environment and the Company reputation.
- This training course on Risk Assessment within Production Operations aims to provide hands-on experience in the application of advanced risk assessment techniques relevant to the process industry. It includes consideration of the consequences of major hazards, in terms of fire, explosion and toxic releases.
- Participants on the Risk Assessment within Production Operations training course will learn how to:
  - Improve practical skills in applying advanced risk assessment techniques relevant to the process industry
  - Effectively balance risk against cost in order to optimize risk reduction measures
  - Motivate people for improved safety culture
  - Appreciate the role of Risk Assessment in the avoidance, control and mitigation of major hazards

## PROGRAMME OBJECTIVES

This practical training course on Risk Assessment within Production Operations aims to enable participants to achieve the following objectives:

- Recognise the difference between hazard, risk and risk assessment
- Learn how to evaluate different types of risk
- Develop the skills of applying advanced risk assessment techniques relevant to the process industry
- Develop a strategy for planning and implementing risk reduction action plans
- Appreciate the contribution of human error to accidents

## WHO SHOULD ATTEND?

The Risk Assessment within Production Operations training course is suitable for, but not limited to:

- Supervisors and line management with HSE responsibilities
- Production, project, process, mechanical, control, maintenance and HSE personnel
- Personnel involved in implementing the Company's HSE Management System

## TRAINING METHODOLOGY

- In the Risk Assessment within Production Operations training course, delegates will learn through active participation including inspiring presentation tools and an interactive programme and role-playing activities, presented in a lively, enthusiastic and interesting style. Delegates will take part in topic exercises, case studies and the practical training.

## PROGRAMME SUMMARY

- Highly participative Risk Assessment within Production Operations training course will analyse incident causation and the role of human error in relation to accidents and include methods for promoting a positive safety culture in organisations. Participants will be able to apply skills learnt from this training at a practical level to implement the Company's HSE Management System. Several process safety case studies are considered in this training course.

## PROGRAM OUTLINE

### Introduction to Risk Assessment

- The concepts of hazards, risk and risk assessment and a review of the risk assessment process
- Syndicate Exercise: Risk Assessment and HSMS to control risk
- Personal Safety and Process Safety
- Syndicate exercise: Process Safety exercise (Part 1)
- Risk Assessment tool: BowTie Diagram
- Syndicate exercise: Process Safety exercise (Part 2)
- Layers of Protection and Barriers (Control Measures)

### Elements of HSE Management Systems and Process Safety

- A brief Introduction to Environmental Issues
- Key Environmental Issues
- Land, Air and Water
- Process Safety – Fires and Explosions
- Fault Tree Analysis
- Dangerous Substances and Explosive Atmospheres Risk Assessment
- Key elements of the HSE Management System

- Elements of HSE – Management Systems
- Selection of Contractors
- Control of Contractors
- Case Study: Contractors doing their thing
- Check and Audit of Contractors
- Isolation of Plant
- Case Study: Fire in a Polypropylene Plant
- Process Safety – Understanding the process and the effect of change
- Syndicate exercise: Cooling system failure

## Major Accidents and How they occur

- Permit to Work Systems
- Principles of operation
- Example of failure
- System Failure: Review of a Process Over-Ride Incident
- How “Barriers” are defeated – How major incidents occur
- Major Accidents and how they happened – The timeline to disaster
- Major Accidents and how they happened – An out of hours’ plant explosion
- Consideration of Root Cause
- Process Safety: Leading and Lagging Indicators
- Major Incident Analysis
- Incident Occurrences; Eye Witness Testimonies; Analysis Team
- Gathering Evidence; Expert Support; Incident Sequence
- Preliminary Causes; Root Cause Analysis; Human Factors
- Risk Control Recommendations; Analysis Report

## Human Factors and Risk Assessment

- Layers of Protection
- Review of BowTie
- LOPA
- Introduction to Human Factors and Human Error
- Errors and Violations
- Syndicate Exercises
- Review of a Major Industrial Incident involving errors and violations
- Improving Human Reliability
- Reactive and Active Monitoring

## Major Incidents, Emergency Response, and the Role of Safety Culture

- Rules vs. Risk Assessment
- Process Safety: the start-up phenomena
- Case Study: Everything went wrong
- Rethink – what was “the” root cause?
- What is Health and Safety Culture?
- Development of positive safety culture and how to promote safety culture
- Overview of Emergency Response Planning
- Review of Barriers