



HSE136

Risk Assessment within Production Operations

Course Introduction:

This course is concerned with the potential health, safety & environmental hazards arising from the operation of large scale oil and gas production and processing facilities. The focus is on major hazards such as fire, explosion and toxic gas releases, but some of the techniques featured are applicable to the whole range of workplace risks and environmental impacts. The essential first step is hazard identification, which may be carried out by means of checklists, inventorization of equipment and hazardous materials, and by structured techniques such as HAZOP. Once identified, the potential consequences may be determined by a screening-level consequence analysis, and if the consequences are significant, a risk assessment may be required, in which the probability factor is taken into account. This may be done by simple qualitative methods such as the Risk Matrix, or if necessary by more thorough quantitative approach, in which the consequences are fully evaluated using computer models and the possible event scenarios are examined using Fault Trees and Event Trees, supported by statistical data from experience of incidents, equipment failures and human errors.

In this course, all of these techniques will be presented, and guidance will be provided on their proper applications and range of usefulness. The attendees will carry out exercises in hazard identification, consequence analysis and risk assessment and will apply simple mathematics to calculate probabilities, frequencies etc. They will learn the essential "do's and don'ts" of risk assessment and should finish the course equipped either to carry out their own assessments or to direct staff or contractors doing such work.

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International Centre For Training & Development

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- Identify the importance of risk, risk assessment and hazard
- Differentiate between the basics of consequence analysis and screening-level consequence analysis
- Discuss types of risk that includes people, assets, environment, reputation and etc.
- Explain quantitative risk assessment and quantitative risk analysis
- Determine the use of risk assessment

Who Should Attend?

This course is intended for all supervisors and line management who need to fulfill their role within HSE, production, process, mechanical, control, maintenance, and HSE personnel. Also suitable to all personnel involved in implementing the company's HSE management system.

Course Outline:

Day 1:

Pre-Test

Introduction

- The importance of risk assessment in projects and operations
- Typical hazards in oil & gas facilities - examples
- Risk management through the facility life-cycle
- Business gains from safety in operation
- PDO policies on HSE risk management, use of HEMP process, etc.

Hazard Identification

- Simple methods - Inventories, Checklists
- Hazard and Operability Study (HAZOP) - Basis of the technique - The role of the team members and the team leader - Planning & preparation - Documentation, data requirements and reports
- Other techniques - PHA, Dow or Mond Index, "What If"? Etc.
- The attendees will play roles in a HAZOP team

Day 2:

Basics of Consequence Analysis

- Typical hydrocarbon process fluids and their properties
- Hole sizes and leak rates
- Flash vaporisation, formation of liquid pools, evaporation
- Ignition
- Jet fires and pool fires
- Explosions - confined spaces, in congested plant, in unconfined areas
- Asphyxiates and toxic gases
- Vulnerability of personnel, buildings and equipment

Screening-Level Consequence Analysis

- Use of simplifying assumptions

Day 3:

Introduction to Risk Assessment

- Types of risk - people, assets, environment, reputation, and more.....
- Measures of risk - probability and severity, the PDO Risk Matrix
- Defining the "initiating events" - usually, a set of leaks
- Qualitative assessment of Frequency and Severity

Quantitative Risk Assessment

- Frequency analysis - equipment failure rate data, Fault Trees
- Accident scenarios - Event Trees, wind/weather effects, emergency response, failures of protective systems, use of consequence analyses

Day 4:

Quantitative Risk Analysis – concluded

- Human factors, human reliability and errors
- Risk calculations - Individual Risk (IRPA), Societal Risk (PLL), risk contours, F-N curve
- Use of risk assessment to support plant sitting, layout and spacing decisions
- Use of risk results in decision-making about preventive and protective safeguards - cost benefit analysis

Quantitative Risk Assessment Exercise

- The exercise will provide an example of risk assessment used to decide on the best options for safety upgrades to an existing facility. Attendees will make approximate assessment of the risks; develop a list of possible upgrades and use risk criteria and a cost-benefit approach to decide on the best options.

Day 5:

The use of risk assessment to support plant sitting, layout and spacing decisions

- Risk Criteria
- Development of numerical risk criteria
- Measures of Risk
- Individual Risk
- Measures of total risk due to the facility
- Safety Regulation using Risk Estimates
- Previous examples of Government Risk Criteria

Post Test

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, Hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session